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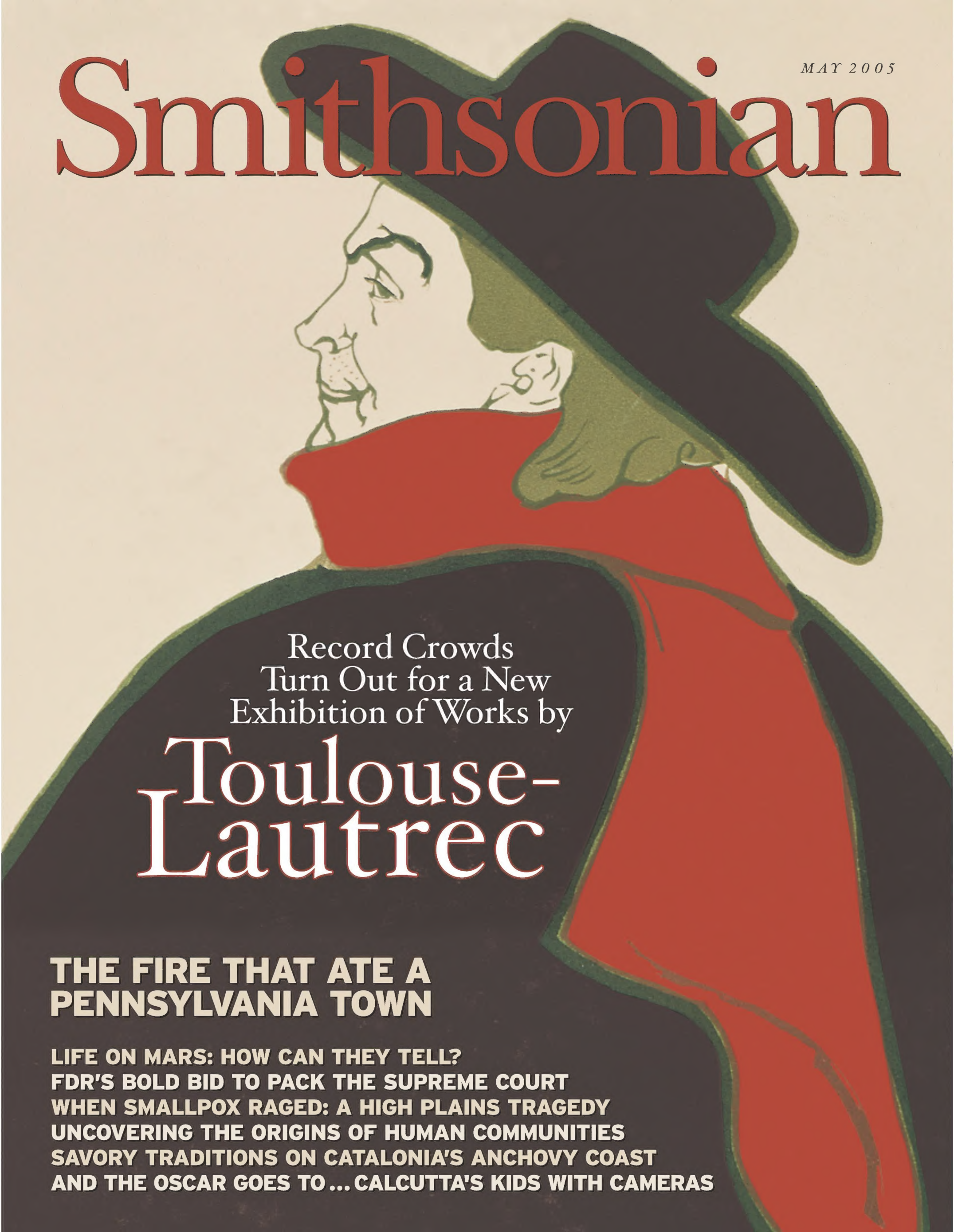
MAY 2005



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Turn Out for a New
Exhibition of Works by

Toulouse-Lautrec

THE FIRE THAT ATE A PENNSYLVANIA TOWN

LIFE ON MARS: HOW CAN THEY TELL?
FDR'S BOLD BID TO PACK THE SUPREME COURT
WHEN SMALLPOX RAGED: A HIGH PLAINS TRAGEDY
UNCOVERING THE ORIGINS OF HUMAN COMMUNITIES
SAVORY TRADITIONS ON CATALONIA'S ANCHOVY COAST
AND THE OSCAR GOES TO ... CALCUTTA'S KIDS WITH CAMERAS

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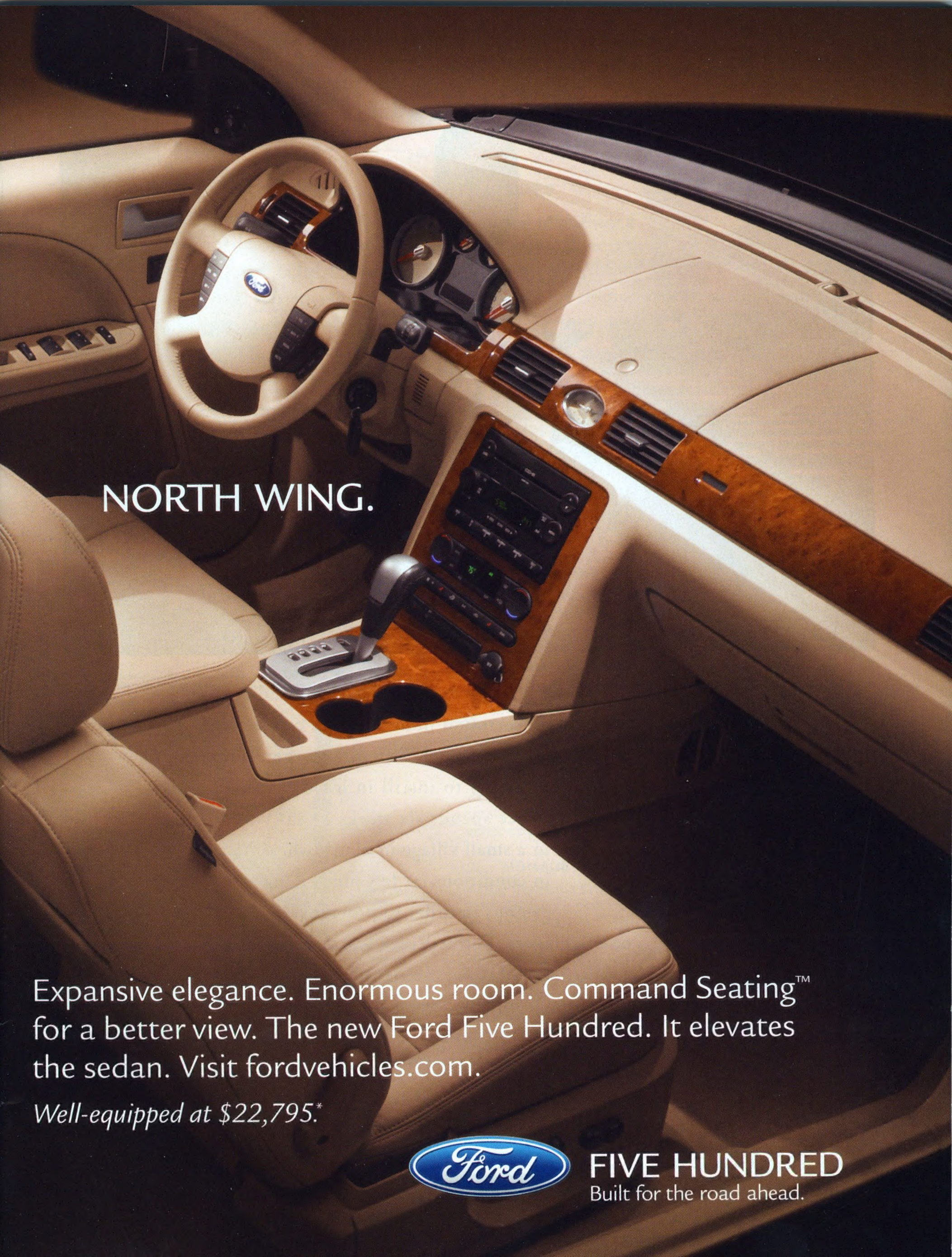

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Every car company is concerned about the people inside its cars.

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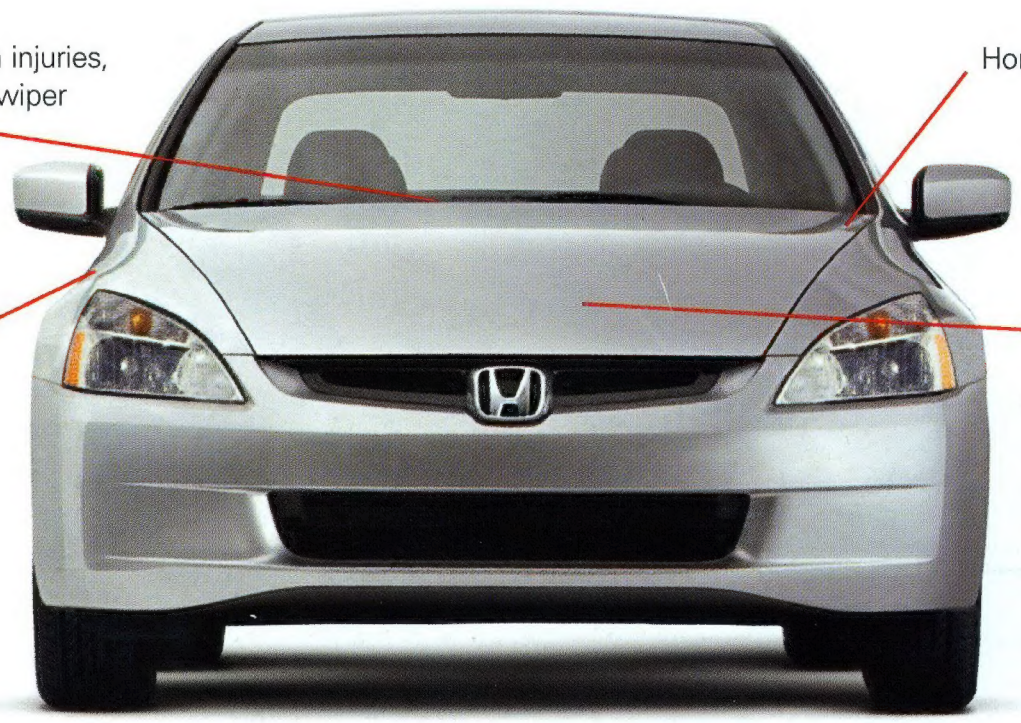
To help reduce pedestrian injuries, the modified windshield-wiper system helps absorb energy in the event of an accident.

The energy-absorbing space under the front fenders is designed to minimize injury.

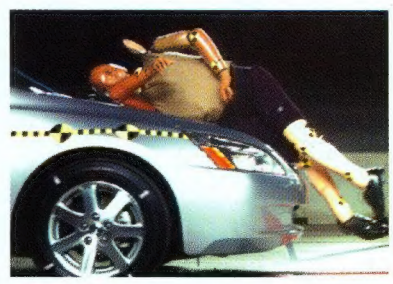


Honda redesigned the hood hinge so it bends with the force of an impact to help minimize pedestrian injuries.

The specially designed hood creates a space between the engine and the hood to lessen the severity of an impact.

As part of Honda's commitment to "Safety for Everyone," we are leading the industry in technology to help protect pedestrians in the event of an accident. Approximately 70,000 pedestrians a year are involved in traffic crashes. And about 5,000 of these end in fatalities. In our efforts to help reduce injuries, especially to the head, Honda created POLAR II, a unique pedestrian test dummy with sensors that help analyze the types of injuries that could be sustained in an accident. Our pioneering research has led to the development of a number of pedestrian-protection features, including injury-reducing designs that minimize direct contact with the most rigid part of the vehicle. More than 2 million U.S. Honda and Acura vehicles on the road today have this equipment. Honda is firmly committed to advancing our safety technologies, with our goal of "Safety for Everyone" leading the way.

Created by Honda engineers, POLAR II is the most advanced pedestrian test dummy, and simulates the kinematics of the human body.



POLAR II has instruments that measure the level of injury throughout the body, including the head, neck, chest, abdomen and legs.

HONDA

The Power of Dreams

safety.honda.com

Based on Traffic Safety Facts 2003 from NHTSA. 2005 Accord EX Sedan shown. ©2005 American Honda Motor Co., Inc.

In his pursuit of a master's degree in Theological Studies from Berkeley, Vince Patton could surround himself in the comforts of the library, the classroom, or the chapel. But true to the values he attempts to instill in his own students, Vince spends six weeks a year volunteering in a small village in Haiti, where he labors in conditions far less plush than he finds on campus in order to provide food, clothing, and medicine to poor villagers. For as Vince learned during his 30 years in the U.S. Coast Guard, values aren't what you get out of an experience, they're what you put in.

DEVOTION TO DUTY

– VINCE PATTON
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"Just uphill, the earth is ablaze. Vegetation has been obliterated along a quarter-mile strip. Dead trees, their trunks bleached white, lie in tangled heaps, stumps venting smoke through hollow centers."

—"FIRE IN THE HOLE," PAGE 52

FEATURES

52 FIRE IN THE HOLE

All around the planet, slow-burning, subterranean coal fires are threatening towns, polluting the atmosphere and, some say, hastening global warming

BY KEVIN KRAJICK / PHOTOGRAPHS BY ERICA FREUDENSTEIN

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China's coal fires are the world's worst **BY MIKE MEYER**

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Filmmaker Zana Briski's documentary about children in a red-light district learning to take pictures earned her an Oscar—and has given some kids a second chance **BY ANDREW CURRY**

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Virtually annihilating the Mandan Indians, the devastating smallpox outbreak of 1837 became one of North America's worst epidemics ever **BY LANDON Y. JONES**

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Along Catalonia's rocky shore, the delectable fish—a far cry from America's pizza topping—is fighting for its culinary life

BY CHRISTOPHER HALL / PHOTOGRAPHS BY TINO SORIANO

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When the U.S. Supreme Court seemed bent on shredding FDR's New Deal, the just-reelected president set out to shape the court in his own image **BY WILLIAM E. LEUCHTENBURG**

ERICA FREUDENSTEIN

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THIS PAGE: In the abandoned coal town of Centralia, Pennsylvania, a danger sign (over mining engineer David Philbin) lures as well as deters visitors.

COVER: *Aristide Bruant dans son cabaret* is one of several posters Toulouse-Lautrec made featuring the popular performer. So prevalent were posters of the singer that one Parisian complained, "You can't go anywhere without finding yourself face to face with him." Image from Scala / Art Resource

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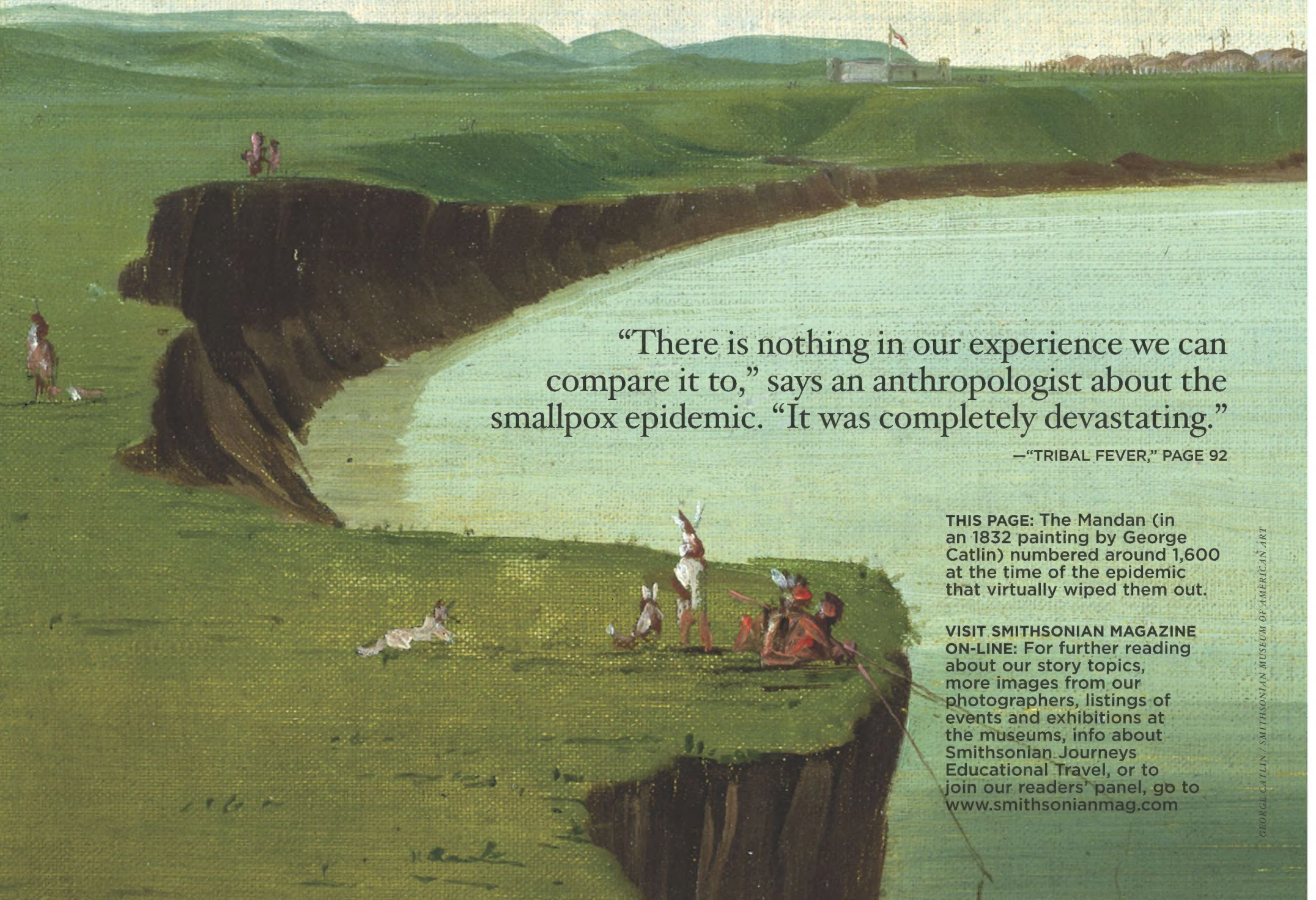

"There is nothing in our experience we can compare it to," says an anthropologist about the smallpox epidemic. "It was completely devastating."

—"TRIBAL FEVER," PAGE 92

THIS PAGE: The Mandan (in an 1832 painting by George Catlin) numbered around 1,600 at the time of the epidemic that virtually wiped them out.

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EDITOR'S NOTE

DIGGING DEEP

FOR SOME STORIES, THE ROOTS GO WAY BACK, EVEN TO CHILDHOOD **BY CAREY WINFREY**

RESEARCHING Franklin Delano Roosevelt's 1937 attempt to pack the U.S. Supreme Court ("Showdown on the Court," p. 106), historian William E. Leuchtenburg encountered a note handwritten to a Southern U.S. Senator. It read: "If you don't come across with the money, I'm going to tell your wife everything." He declines to say which Southern senator, but stay tuned. Sounds like a story to me.

Leuchtenburg got hooked on politics and FDR—he is the author of ten books, including *Franklin D. Roosevelt and the New Deal, 1932-1940*—when he was 9 years old. The year was 1932 and his parents let him stay up to listen to the Democratic National Convention, in Chicago that year, on the radio. After innumerable speeches, Leuchtenburg remembers, "I finally went to bed, but got up at 6:30 a.m. to tally the first two roll calls before the convention abruptly recessed. Not until the next day did I find out that during a second night while I was asleep, the Democrats had nominated FDR."

Balter at Catalhoyuk: With access, every year since 1998.

THE FIRST TIME Michael Balter visited the archaeological site known as Catalhoyuk, in Turkey—where hunter-gatherers 9,500 years ago settled as a community—he traveled from Paris, only to discover that the dig's director, Ian Hodder, was away. But a month later, he caught up with Hodder in Cambridge, England, and spent the better part of a weekend talking with him about his research over lunches, dinners and leisurely coffees—"rather than the hour or two that I probably would have had in Turkey."

That was in 1998. Balter's access to Hodder led Balter to return to Catalhoyuk every year since, and led as well to Balter's book about Catalhoyuk, *The Goddess and the Bull*, recently published by The Free Press. Though written expressly for SMITHSONIAN, Balter's article ("The Seeds of Civilization," p. 68) draws on the wealth of material he reported for his book.

BEFORE CARL ZIMMER began working on "Life on Mars?" (p. 76), he says he had "a naive assumption that once you find a fossil or some other evidence of life, it's pretty easy to recognize it. After all, we don't have any trouble telling a tree from a rock." But at the level of microbes and molecules, Zimmer discovered, it's a different story. "What I love about scientists," says Zimmer, "is that this sort of ambiguity doesn't make them walk away in despair. They just throw themselves at the problem even more. Andrew Steele, whom I visited during my research, seems to work 50 hours a day on new devices for detecting signs of life, and when he's not building them, he's testing them out on some remote island. But I can understand why someone could get so deep into this work. After all, what would be more awesome, more life-changing, than to find indisputable signs of life on Mars?"

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To learn more, call 1-877-VYTORIN or visit vytorin.com Please read the Patient Product Information on the adjacent page.

Continue to follow a healthy diet, and ask your doctor about adding VYTORIN.

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Patient Information about VYTORIN (VI-tor-in)

Generic name: ezetimibe/simvastatin tablets

Read this information carefully before you start taking VYTORIN. Review this information each time you refill your prescription for VYTORIN as there may be new information. This information does not take the place of talking with your doctor about your medical condition or your treatment. If you have any questions about VYTORIN, ask your doctor. Only your doctor can determine if VYTORIN is right for you.

What is VYTORIN?

VYTORIN is a medicine used to lower levels of total cholesterol, LDL (bad) cholesterol, and fatty substances called triglycerides in the blood. In addition, VYTORIN raises levels of HDL (good) cholesterol. It is used for patients who cannot control their cholesterol levels by diet alone. You should stay on a cholesterol-lowering diet while taking this medicine.

VYTORIN works to reduce your cholesterol in two ways. It reduces the cholesterol absorbed in your digestive tract, as well as the cholesterol your body makes by itself. VYTORIN does not help you lose weight.

Who should not take VYTORIN?

Do not take VYTORIN:

- If you are allergic to ezetimibe or simvastatin, the active ingredients in VYTORIN, or to the inactive ingredients. For a list of inactive ingredients, see the "Inactive ingredients" section at the end of this information sheet.
- If you have active liver disease or repeated blood tests indicating possible liver problems.
- If you are pregnant, or think you may be pregnant, or planning to become pregnant or breast-feeding.

VYTORIN is not recommended for use in children under 10 years of age.

What should I tell my doctor before and while taking VYTORIN?

Tell your doctor right away if you experience unexplained muscle pain, tenderness, or weakness. This is because on rare occasions, muscle problems can be serious, including muscle break-down resulting in kidney damage.

The risk of muscle breakdown is greater at higher doses of VYTORIN.

The risk of muscle breakdown is greater in patients with kidney problems.

Taking VYTORIN with certain substances can increase the risk of muscle problems. It is particularly important to tell your doctor if you are taking any of the following:

- cyclosporine
- danazol
- antifungal agents (such as itraconazole or ketoconazole)
- fibric acid derivatives (such as gemfibrozil, bezafibrate, or fenofibrate)
- the antibiotics erythromycin, clarithromycin, and telithromycin
- HIV protease inhibitors (such as indinavir, nelfinavir, ritonavir, and saquinavir)
- the antidepressant nefazodone
- amiodarone (a drug used to treat an irregular heartbeat)
- verapamil (a drug used to treat high blood pressure, chest pain associated with heart disease, or other heart conditions)
- large doses (≥1 g/day) of niacin or nicotinic acid
- large quantities of grapefruit juice (>1 quart daily)

It is also important to tell your doctor if you are taking coumarin anticoagulants (drugs that prevent blood clots, such as warfarin).

Tell your doctor about any prescription and nonprescription medicines you are taking or plan to take, including natural or herbal remedies.

Tell your doctor about all your medical conditions including allergies.

Tell your doctor if you:

- drink substantial quantities of alcohol or ever had liver problems. VYTORIN may not be right for you.
- are pregnant or plan to become pregnant. Do not use VYTORIN if you are pregnant, trying to become pregnant or suspect that you are pregnant. If you become pregnant while taking VYTORIN, stop taking it and contact your doctor immediately.
- are breast-feeding. Do not use VYTORIN if you are breast-feeding.

Tell other doctors prescribing a new medication that you are taking VYTORIN.

How should I take VYTORIN?

- Take VYTORIN once a day, in the evening, with or without food.
- Try to take VYTORIN as prescribed. If you miss a dose, do not take an extra dose. Just resume your usual schedule.
- Continue to follow a cholesterol-lowering diet while taking VYTORIN. Ask your doctor if you need diet information.
- Keep taking VYTORIN unless your doctor tells you to stop. If you stop taking VYTORIN, your cholesterol may rise again.

What should I do in case of an overdose?

Contact your doctor immediately.

What are the possible side effects of VYTORIN?

See your doctor regularly to check your cholesterol level and to check for side effects. Your doctor may do blood tests to check your liver before you start taking VYTORIN and during treatment.

In clinical studies patients reported the following common side effects while taking VYTORIN: headache and muscle pain (see What should I tell my doctor before and while taking VYTORIN?).

The following side effects have been reported in general use with either ezetimibe or simvastatin tablets (tablets that contain the active ingredients of VYTORIN):

- allergic reactions including swelling of the face, lips, tongue, and/or throat that may cause difficulty in breathing or swallowing (which may require treatment right away), and rash; alterations in some laboratory blood tests; liver problems; inflammation of the pancreas; nausea; gallstones; inflammation of the gallbladder.

Tell your doctor if you are having these or any other medical problems while on VYTORIN. This is <u>not</u> a complete list of side effects. For a complete list, ask your doctor or pharmacist.

General Information about VYTORIN

Medicines are sometimes prescribed for conditions that are not mentioned in patient information leaflets. Do not use VYTORIN for a condition for which it was not prescribed. Do not give VYTORIN to other people, even if they have the same condition you have. It may harm them.

This summarizes the most important information about VYTORIN. If you would like more information, talk with your doctor. You can ask your pharmacist or doctor for information about VYTORIN that is written for health professionals. For additional information, visit the following web site: vytorin.com.

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Science Matters

The Institution decides to focus on four basic questions

RIGHT FROM THE START, the Smithsonian gave pride of place to science. The Institution's third secretary, Samuel Pierpont Langley, put our first astronomical observatory, which he described as a "one-story building, or rather shed," on prime real estate, next to the Castle. Today its heir, the Smithsonian Astrophysical Observatory (SAO), has six facilities on three continents and several out in the cosmos. Directly across from the Castle, another of the Smithsonian's early research centers, the National Museum of Natural History (NMNH), is dedicated not only to disciplines such as biology and geology but also to anthropology and archaeology.

Given these historical beginnings, it is especially fitting that the Institution, in accordance with a newly created strategic plan for science, has decided to concentrate its resources over the next five years on addressing four questions, as crucial and engaging to the general public as they are to scientists. They are: What is the nature and origin of the universe? How was the Earth formed and how has life on our planet evolved? How did early humans develop and how did they adapt to the wrenching environmental, cultural and other changes that challenged them? How can we best sustain the Earth's fragile biological diversity for future generations?

Langley, who pioneered astrophysics, the cutting-edge field in which SAO excels today, would no doubt be thrilled to see the stunning images—which are helping to answer the first of these questions—sent to us by the Chandra X-ray telescope. Built by NASA and SAO, Chandra recently sent pictures of Jupiter's poles, where auroras, luminous phenomena such as Earth's aurora borealis, appear like supersized electrical storms. The voltages associated with these auroras, however, are about a hundred times more powerful than the most potent lightning bolt on Earth. By studying Jupiter's auroras, Chandra helps astronomers to fathom magnetic fields, which are important throughout the universe.

Langley would also surely recognize how the scientific enterprise has changed dramatically in the past 100 years. Science at the beginning of the 21st century is a far more specialized—and vastly more expensive—pursuit than it was in the 19th, or for that matter, the 20th century. It was in light of these realities that the Smithsonian recently drafted its plan, "Science Matters: Priorities and Strategies," which was completed only after nine months of careful deliberation by a group of 83 scientists, museum professionals and the Institution's leadership. Building on the Smithsonian's many strengths—its record of advances and its unrivaled collections of specimens—the plan will serve as a broad and ambitious map to guide scientific exploration at the Smithsonian, and beyond.

Whether Smithsonian scientists study mosquito-borne illnesses, early human fossils, the lush treetop canopies of tropical cloud forests or distant galaxies of massive stars, their work often takes them far from the Mall. And it involves them with many other organizations. For example, in the Mars rover project, scientists studying earth and planetary science at the National Air and Space Museum worked with geologists and other specialists from NMNH's Department of Mineral Sciences. Together, they helped maneuver the hardy rovers over the red planet's forbiddingly rocky terrain, deciding not only where to land them but where to gather samples and to go next.

The Chandra telescope: Helping to understand the origins of the cosmos.

Meanwhile, at the Smithsonian Tropical Research Institute in Panama, life scientists have had the rare opportunity to study a complex environment containing a number of unique ecosystems. By taking a regular census of the flora and fauna there, scientists will better determine how the environment changes over time.

The Smithsonian has come a long way from Langley's little observatory by the Castle. But Institution science, as our new plan reminds us, still reaches for the stars—and helps us understand our place among them.

Lawrence M. Small
SECRETARY OF THE SMITHSONIAN INSTITUTION

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LETTERS

Readers respond to the March issue:

MAN FOR ALL REASONS?

EDWARD ROTHSTEIN writes that Churchill's legacy is being reassessed today by historians and social commentators in various contexts ("Contemplating Churchill"). By any measure, the lasting image of Churchill, astride the world stage just prior to and during the war, is one of a magnificent presence, a resonating force and a calming voice in the darkest of storms. Reassessment seems a dominant proclivity among modern historians. Taken in the context of time and place, such reappraisals can serve to heighten the humanness of great men. But they cannot dilute or change the greatness of what these giants of intellect and spirit accomplished at crucial moments in history. Rothstein says that the more he studied Churchill, the more he believed he "would not have liked him very much." I think he would have been fascinating company.

BERNARD G. ELLIKER
LAUREL, MARYLAND

AS AN AMERICAN of Asian Indian descent, the Churchill article struck a special chord in me. Finally there appears to be an attempt to view Churchill with some of his drawbacks. I was a teenager growing up in India during its struggle to be independent of Britain. We were fully aware of the tactics, and sometimes brutal methods, used by Britain to frustrate and destroy the movement. Mr. Churchill was justifiably viewed as an Anglo-Saxon chauvinist, arrogantly opposing India's independence and bad-mouthing Gandhi. We from India never had and never will have that blind admiration for Churchill as many do in the United States. Clement Atlee was a far better statesman than Winston Churchill, and it was Atlee, in his sagacity, who made it possible for India to be freed from imperial domination. Had Churchill stayed on as prime minister, he would have adamantly opposed India's independence and would have

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LETTERS

surely lost his battle with that "fakir," Mahatma Gandhi.

BYRAVAN VISWANATHAN
GETTYSBURG, PENNSYLVANIA

PERHAPS CHURCHILL is a case of the times making the man. We all have character flaws and strengths. His assessment of the Nazi goals coupled with his ability to deliver stirring speeches and his iron will have me agreeing with his daughter—his gift was our very liberty. Attempts to place his leadership outside of the unique setting of World War II are anachronistic and meaningless. Al Qaeda is not prewar Germany. Mr. Churchill should be honored for his success in holding Britain together in its darkest hour. I cannot believe that there was a better man for that job.

RUSSELL AGREEN
DENTON, MARYLAND

TOO MUCH IRISH WHISKEY?

PAGING THROUGH "Ireland Unleashed," I noted three photographs set in Irish pubs, along with another of people drinking on a dock. Isn't that a bit of overkill?

WILLIAM L. KEOGAN
VALLEY STREAM, NEW YORK

I AM PLEASED that Ireland is experiencing economic success and that so many are proud to call Ireland home, but I am saddened to learn that aspects of Ireland's beautiful history are being lost because younger generations are not learning these cultural traditions. If traditional arts and skills—knitting, thatched-roof cottages, dancing—as well as language and enduring faith are left behind in the name of "progress," then maybe the Irish people are misjudging success. If Ireland should come to mean nothing more than new houses and busy clubs, then the true Ireland that most people love will have vanished. The Irish people have endured so much throughout time for its people to *not* cherish that history.

JESSICA BURDINE
CINCINNATI, OHIO

CORRECTION: *"Future Shocks" misstated the amount that the Washington and Oregon coastline is rising in some places each year. It is .15 inch.*

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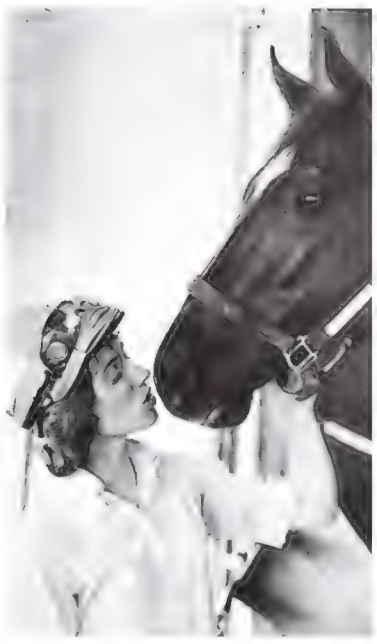
WHERE ARE THEY NOW?

DIANE CRUMP

PIONEERING JOCKEY



Diane Crump prepares for the May 2 Kentucky Derby with her mount, Fathom. Says Crump today: "He was very special to me."

DIANE CRUMP, the first female jockey to ride in a Kentucky Derby, on May 2, 1970, recalls being the only girl "on the backside [stable area]" when she received her license to exercise racehorses at age 16. She also well remembers the elation she felt, four years later, when she and her mount, Fathom, walked onto the Churchill Downs track to the sounds of "My Old Kentucky Home." "It's like nothing that anyone will understand unless they're there," she says. Even though Crump finished 15th out of 17 starters, she says that Fathom, a sprinter, "ran the race of his life" in the mile and a quarter event.

Sidelined from riding due to an injury sustained while breaking a yearling racehorse in 1990, Crump, 55, with her daughter, Della Divine, 26, owns Diane Crump Equine Sales in Virginia, a horse brokerage. Her advice to aspiring female jockeys? "Don't let anyone tell you no."

—MIMI KIRK

The Confederate Memorial Carving on Georgia's Stone Mountain, the largest high relief sculpture in the world, is dedicated May 9. Begun by Mount Rushmore sculptor Gutzon Borglum in 1923, the carving features the figures of (left to right) Jefferson Davis, Robert E. Lee and Stonewall Jackson on horseback.

IN THE NEWS

On May 29, the California Court of Appeal overturns Black Panther leader Huey Newton's voluntary manslaughter conviction for the murder of John Frey, an Oakland, California, police officer. Newton, co-founder (with Bobby Seale) of the revolutionary Black Panther Party, had claimed to be unconscious from a bullet wound at the time of Frey's death. Doctors supported Newton's assertion. He died of a gunshot wound in 1989 at age 47.

A National Guard unit fires on students protesting U.S. military involvement in Cambodia at Kent State University in Kent, Ohio, May 4. Allison Krause, 19, Sandra Lee Scheuer, 20, Jeffrey Glenn Miller, 20 (lying at right with a kneeling Mary Ann Vecchio), and William Schroeder, 19, are killed. Ten days later, police fire on protesting African-American students at Mississippi's Jackson State College. Two students die.

THE LIST

1970 Pulitzer Prize Winners

Fiction: ***Collected Stories*** **by Jean Stafford**
Drama: ***No Place to be Somebody*** **by Charles Gordone**
History: ***Present at the Creation: My Years in the State Department*** **by Dean Acheson**
Biography or Autobiography: ***Huey Long*** **by T. Harry Williams**
Poetry: ***Untitled Subjects*** **by Richard Howard**
General Nonfiction: ***Gandhi's Truth*** **by Erik H. Erikson**
Music: ***Time's Encomium*** **by Charles Wuorinen**

COMINGS & GOINGS

BORN: Naomi Campbell
Model, May 22

BORN: Joseph Fiennes
Actor, May 27

DIED: Billie Burke, 84
Actor, May 15

DIED: Walter Reuther, 62
President of the United Auto Workers, May 10

"For years, for years, in Southern schools, black children have been passing white schools in buses to get to the little one-, two- and three-room shacks across town. Now, whites are screaming about busing."

—CONGRESSWOMAN SHIRLEY CHISHOLM (D-NY), ON THE DESEGREGATION PROCESS, IN THE MAY 22 *NEW YORK TIMES*

LEFT, TOP TO BOTTOM: AP / WIDE WORLD PHOTOS; DELLA DIVINE; RIGHT: KEVIN FLEMING / CORBIS; BETTMANN / CORBIS; JOHN FILO; JENNIFER GRAYLOCK / AP / WIDE WORLD PHOTOS; KEVIN WINTER / GETTY IMAGES; BETTMANN / CORBIS (2); LEIF SKOOGFORS / CORBIS

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MODEL FAMILY

SALLY MANN'S UNFLINCHING PHOTOGRAPHS OF HER CHILDREN HAVE PROVOKED CONTROVERSY. BUT ONE OF HER NOW-GROWN DAUGHTERS WONDERS WHAT ALL THE FUSS WAS ABOUT **BY MOLLY ROBERTS**

IN SALLY MANN'S FARMHOUSE, in Lexington, Virginia, a photograph of her children dominates a room, much as they have dominated their mother's creative life for the past 20 years. The picture (below) is notable for both the kids' innocent beauty and their knowing, defiant gazes, and it epitomizes Mann's work, which has been criticized for its frankness but mostly celebrated for its honesty. In 2001, *Time* magazine called her "America's best photographer."

Mann is a poet of the personal, from her haunting evocations of the Virginia countryside, to her intimate portraits of her children, to her latest project, a graphic elegy to her husband, who has muscular dystrophy. She grew up in rural Virginia as a "feral" child, she recalls, often running around outdoors without clothes. Her father, a physician, a civil rights supporter and, she lovingly says, an "oddball," gave her a camera when she was 17 and told her the only subjects worthy of art were love, death and whimsy. Sally Mann studied literature in college, and later attended photography workshops

"They have been involved in the creative process since infancy," Sally Mann says of her children (Virginia, Emmett and Jessie in 1989).

SALLY MANN / EDWYNN HOUK GALLERY

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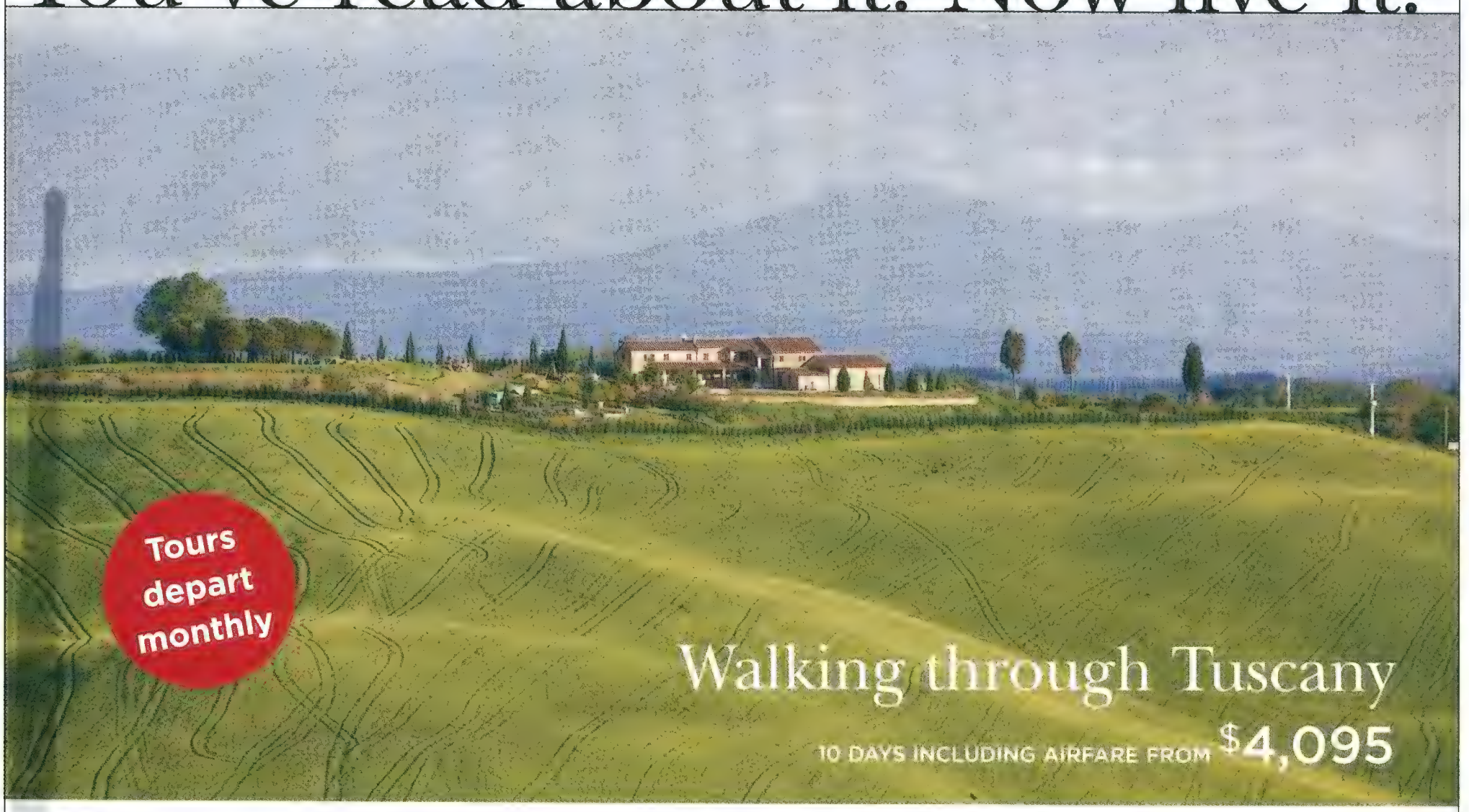

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The pictures of her half-clothed children sparked outrage.

by Ansel Adams and George Tice, whose darkroom wizardry she embraced.

Mann's third book, *Immediate Family,* published in 1992 to coincide with a solo exhibition at a New York City gallery, won her wide notoriety. It features dozens of black-and-white photographs of her three children, typically playing (or playacting) in pastoral settings. Many are dreamy, expressing some of the fleeting charms particular to childhood, but others are almost surreal (her son's bloody nose, a daughter in a tutu next to a dead deer). "I'm a little like Flaubert, who when he looked at a young girl saw the skeleton underneath," says Mann, 54. "It's not morbid, it's just this awareness of the antithetical aspect of every situation."

"My mother has no blinders on," says Jessie Mann, an artist (right, with her siblings Virginia and Emmett in 2003).

The pictures of her half-clothed or naked children sparked outrage in some quarters. "Selling photographs of children naked for profit is immoral," the televangelist Pat Robertson told the filmmaker Steven Cantor, whose documentary about Mann is due to air on HBO this year. But others say such criticism is unwarranted, pointing out that Mann's photographs are not erotic and clearly reflect a mother's loving regard. In fact, prior to publishing and exhibiting the pictures, Mann says that she showed the images to an FBI agent and also introduced her kids to him, seeking assurance that the agency wouldn't pursue her on pornography charges; it did not. "My parents were eccentric, and when I had my own children, I didn't see any point in making them wear bathing suits when we swam in the river," Mann says. "There was no one within five miles of us."

Mann now uses an old view camera.

The photographs made a big splash, covered by news media from *Art Forum* to *People.* Jessie Mann, now 23, says the publicity coincided with her realization that their childhood wasn't "like other people's." The experience of collaborating with her mother taught her about the power of art, she says. And she admires the way the photographs provoke questions about the difference (or lack of it) between reality and fantasy, even as they touch on something deeper: "There is magic in things, life is magical and wonderful." Today, Jessie, who lives in Lexington, is experimenting with mixed-media artwork, combining photography, painting and writing. The other Mann children are Emmett, 24, a landscaper, and Virginia, 20, a college student. Looking back on her initial collaboration with the children, Sally Mann says, "There was a real leap of faith on their part. They were extremely generous and trusting, but I wouldn't recommend anyone else trying to do it."

Mann's most recent exhibition of photographs, at the Corcoran Gallery of Art in Washington, D.C. last year, drew on her abiding interest in family, loss, decay and memory, but with a twist. Lately she has relied on a photographic technique introduced in 1851 and favored by Civil War documentarian Mathew Brady. It requires a large, cumbersome camera, a glass plate coated with a sticky silver nitrate solution and five-minute exposures. "To achieve something great," she says, "you have to work really hard at it." Mann, who says she has been influenced by 19th-century photographers like Julia Margaret Cameron and Eugène Atget, believes that the wet collodion process adds to the timeless look of her photographs. Also, its fragility creates quirks and imperfections, which help make every image unique. Among the things she has photographed with the big plates are the faces of her children (in extreme close-up), Civil War battlefields, corpses at a forensic study site and the bones of a beloved greyhound, Eva. The photographs appear in her latest book, *What Remains*, published last year by Bullfinch Press. Some might think the subjects gloomy. Not Mann. "Immodestly, I thought they were rather beautiful," the photographer says.

Mann's newest work is a series of nudes of her husband of 35 years, Larry Mann, 56, a self-taught lawyer, as he copes with his disease. It's not unheard of for a photographer to focus on a spouse, but, one critic observed in the *New York Times*, "no woman has ever turned a camera so candidly on a man."

"My mother has no blinders on," Jessie Mann says. "She will always look intensely upon whatever is closest to her."

MOLLY ROBERTS is a photographer and a photo editor at SMITHSONIAN magazine.

SALLY MANN; MOLLY ROBERTS

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ROCKY MOUNTAIN HIGH

AFTER A CANOE CAPSIZES, THE FIRST SIGHT OF THE MOUNTAINOUS "SNOWEY BARRIER" LIFTS THE CORPS' SPIRITS

Meriwether Lewis: "These points of the Rocky Mountains were covered with snow and the sun shone on it in such a manner as to give me the most plain and satisfactory view."

FRANK D. HAGEL

In may 1805, the corps crossed from North Dakota into present-day Montana. While the expedition was traveling upriver, one of the canoes capsized; Sacagawea, on board with her infant son, single-handedly saved much of the canoe's contents, including journals and medicines. A grateful Meriwether Lewis named a river after her. Later that month, Lewis and Clark first saw the Rocky Mountain chain, which they would have to cross to reach the Pacific.

May 14, 1805 [Capt. Meriwether Lewis]
We had been halted by an occurrence, which I have now to recappitulate, and which altho' happily passed without ruinous injury, I cannot recollect but with the utmost trepidation and horror; this is the upseting and narrow escape of the white perogue It happened unfortunately for us this evening that Charbono was at the helm of this Perogue, in stead of Drewyer, who had previously steered her; Charbono cannot swim and is perhaps the most timid waterman in the world; perhaps it was equally unluckey that Capt. C. and myself were both on shore at that moment, a circumstance which rarely happened; and tho' we were on the shore opposite to the perogue, were too far distant to be heard or to do more than remain spectators of her fate; in this perogue were embarked, our papers, Instruments, books medicine, a great part of our merchandize and in short almost every article indispensibly necessary to further the views, or insure the success of the enterprize in which we are now launched to the distance of 2200 miles. surfice it to say, that the Perogue was under sail when a sudon squawl of wind struck her obliquely, and turned her considerably, the steersman allarmed, in stead of putting her before the wind, lufted her up into it, the wind was so violent that it drew the brace of the squarsail out of the hand of the man who was attending it, and instantly upset the perogue and would have turned her completely topsaturva, had it not have been from the resistance mad by the oarning against the water . . . they suffered the perogue to lye on her side for half a minute before they took the sail in, the perogue then wrighted but had filled within an inch of the gunwals; Charbono still crying to his god for mercy, had not yet recollected the rudder, nor could the repeated orders of the Bowsman, Cruzat, bring him to his recollection untill he threatend to shoot him instantly if he did not take hold of the rudder and do his duty.

May 16 [Lewis]
The loss we sustained was not so great as we had at first apprehended; our medicine sustained the greatest injury, several articles of which were intirely spoiled . . . the ballance

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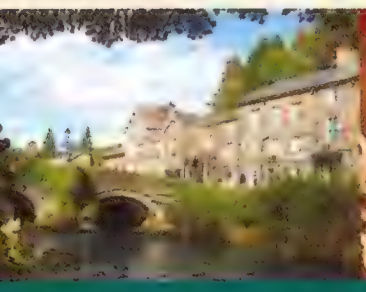

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of our losses consisted of some gardin seeds, a small quantity of gunpowder, and a few culinary articles which fell overboard and sunk, [Sacagawea] to whom I ascribe equal fortitude and resolution, with any person onboard at the time of the accedent, caught and preserved most of the light articles which were washed overboard.

May 26 [Capt. William Clark]
I took one man and walked out this morning, and ascended the high countrey to view the mountains which I thought I Saw yesterday. . . . I crossed a Deep holler and assended a part of the plain elevated much higher than where I first viewed the above mountains; from this point I beheld the Rocky Mountains for the first time with Certainty. . . . whilst I viewed those mountains I felt a Secret pleasure in finding myself So near the head of the heretofore Conceived boundless Missouri; but when I reflected on the difficulties which this Snowey barrier would most probably throw in my way to the Pacific Ocean, and the Sufferings and hardships of my Self and party in them, it in Some measure Counter ballanced the joy I had felt in the first moments in which I gazed on them; but as I have always held it little Short of Criminality to anticipate evils I will allow it to be a good Comfortable road untill I am Compelled to believe otherwise.

May 29 [Lewis]
Last night we were all allarmed by a large buffaloe Bull, which swam over from the opposite shore and coming along side of the white perogue, climbed over it to land, he then alarmed ran up the bank in full speed directly towards the fires, and was within 18 inches of the heads of some of the men who lay sleeping before the centinel could allarm him or make him change his course. . . . The next morning we found that the buffaloe in passing the perogue had trodden on a rifle. . . . it appears that the white perogue, which contains our most valuable stores, is attended by some evil gennii.

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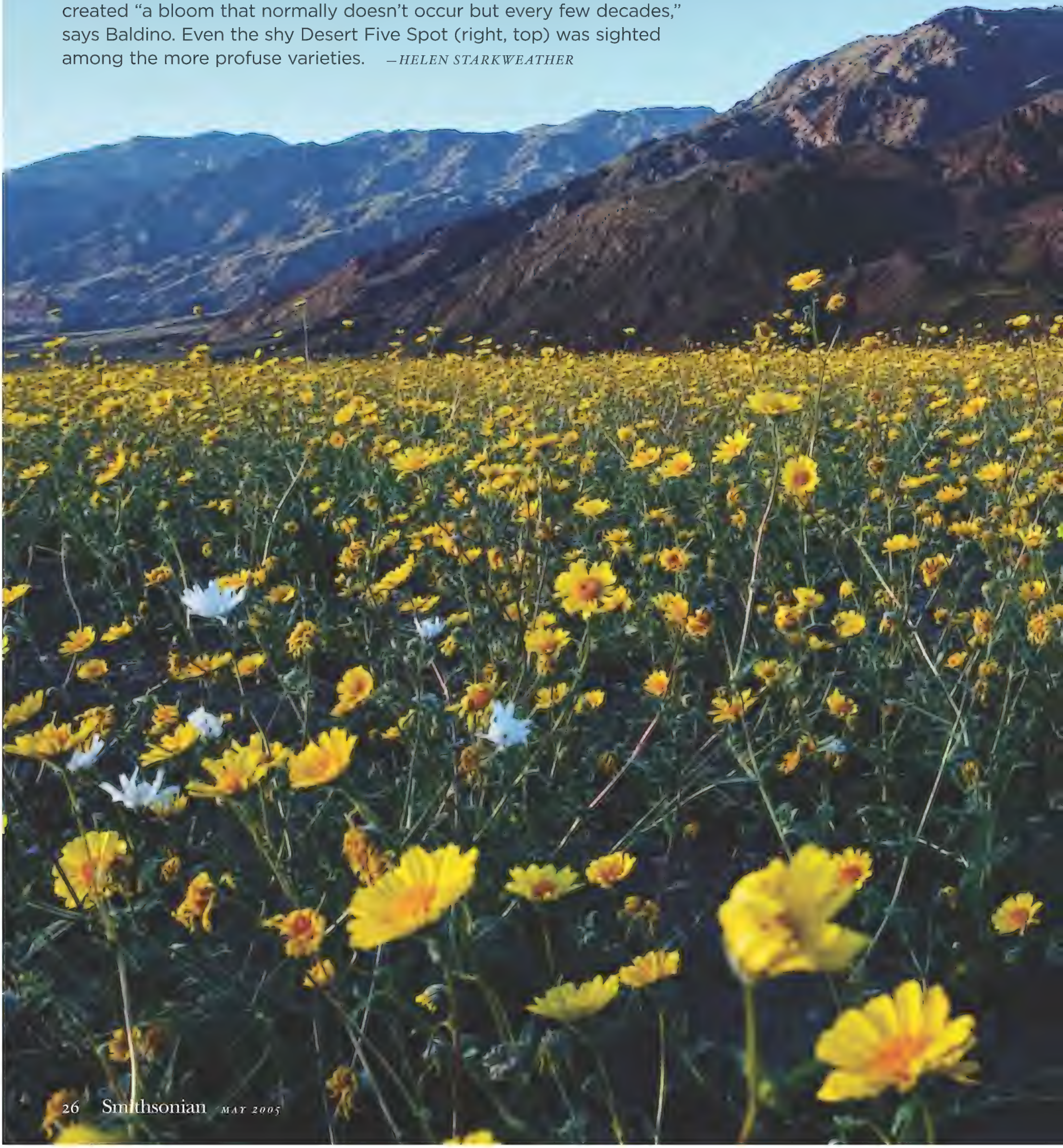
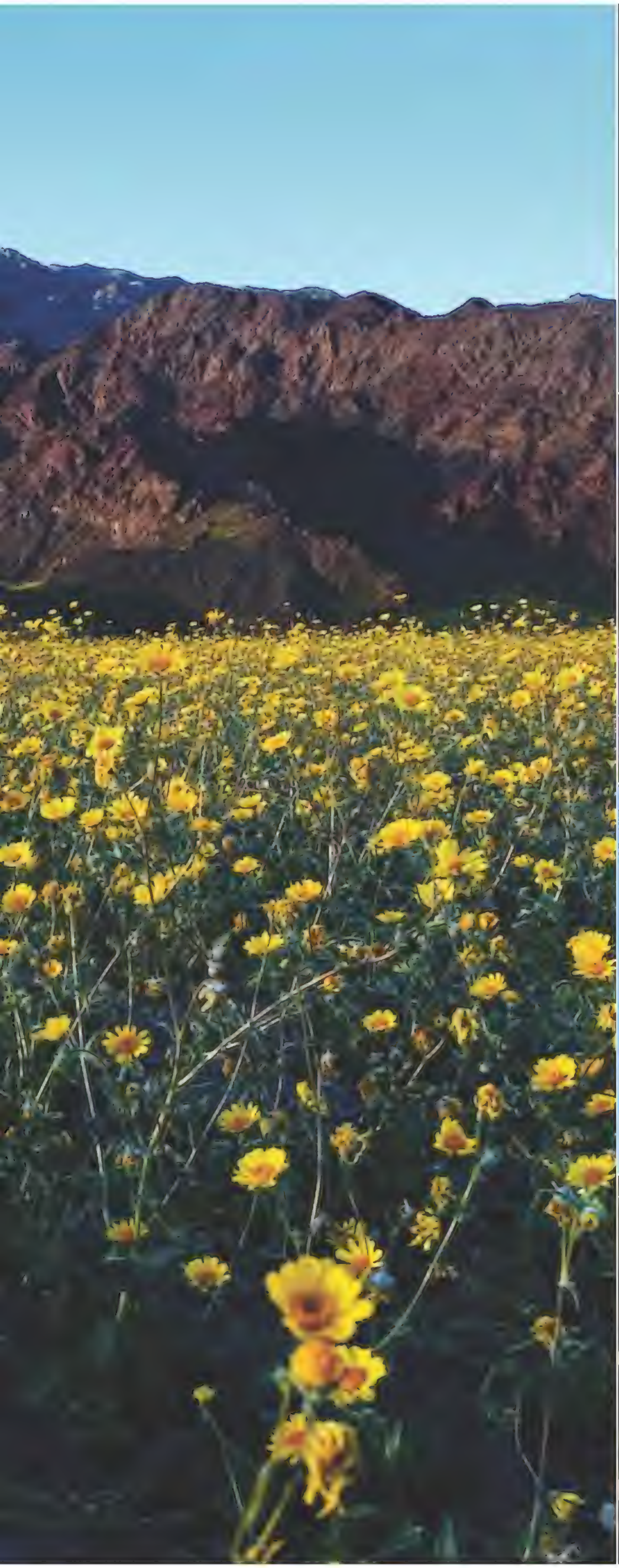
DEATH VALLEY BLAZE "The transformation is breathtaking," says National Park Service chief interpreter Terry Baldino of the rare explosion of wildflowers that in March obscured the harsh landscape of California's Death Valley National Park, where temperatures routinely reach 120 degrees. More than six inches of rain, three times the yearly average, created "a bloom that normally doesn't occur but every few decades," says Baldino. Even the shy Desert Five Spot (right, top) was sighted among the more profuse varieties. —*HELEN STARKWEATHER*





DESERT FIVE SPOT

NOTCH-LEAF PHACELIA

DESERT GOLD (ALIVE AND OPPOSITE)

GRAVEL GHOST

TED SOQUI / CORBIS; PHIL KEMPER; TED SOQUI / CORBIS; KEVIN TAYLOR / IPN; TED SOQUI / CORBIS

RISING FROM THE ASHES

THE ERUPTION OF MOUNT ST. HELENS 25 YEARS AGO THIS MONTH WAS NO SURPRISE. BUT THE SPEEDY RETURN OF WILDLIFE TO THE AREA IS ASTONISHING **BY DAVID B. WILLIAMS**

VIRGINIA DALE was in the first helicopter load of ecologists to land at Mount St. Helens after it erupted 25 years ago this month. "I just remember how bizarre it was going out into that landscape," she says of the suddenly gray, ash-covered terrain. "It gave the impression of total lifelessness."

Dale, at the Oak Ridge National Laboratory in Tennessee, studies ecological succession, or how an environment recovers after a major disturbance. She jokingly calls herself a "disturbed ecologist." When it comes to studying devastation, she says, "Mount St. Helens was off the scale."

The eruption on May 18, 1980, blew away the top 1,314 feet of the mountain, reducing the once symmetrical, glacier-covered summit to a horseshoe-shaped crater. An avalanche of rocks plugged the Toutle River Valley at the base of the mountain and created a 23-square-mile zone of barren, hummocky land. A 300-mile-an-hour lateral blast of hot air and debris flattened the surrounding forest. A cloud of ash climbed to 80,000 feet in 15 minutes and circled the globe in 15 days. Torrents of superheated air, gases and rocks—a mixture known as a pyroclastic flow—surged down the mountain's northern face for hours, destroying everything in its path. All told, the eruption blasted more than 230 square miles of forests, lakes, meadows and streams. It killed 57 people, making it the deadliest eruption in U.S. history, and millions of animals and plants. "Death is everywhere," the *Oregonian* newspaper reported. "The living are not welcome."

Today, life has returned with a vengeance. Where the avalanche obliterated everything, Dale has counted more than 150 species of wildflowers, shrubs and trees, with an average of ten new plant species gaining a foothold every year. She has also documented five conifer species, including western hemlock and Pacific silver fir, that aren't supposed to be there yet; according to standard ecological theory, those trees should sprout only after generations of other plants have improved the soil and provided some shade. It seems life can take hold even in the most desolate landscape, and in ways no scientist could have foreseen.

Charlie Crisafulli, a U.S. Forest Service ecologist, has been watching life return to the Pumice Plain, a six-square-mile area that was buried in ash and practically sterilized by the pyroclastic flows. Today, the mossy rain-fed ground cover glows chartreuse in the low light. Dense thickets of alders and willows, many 10 to 15 feet tall, grow along new streams that flow across the plain. Frogs croak, birds call. A small herd of elk grazes in the distance. Wildflowers dot the landscape with splashes of red, yellow, pink, white and purple.

It was these purple wildflowers, prairie lupines, that taught Crisafulli one of the key lessons of succession: the importance of chance. Lupines are not typically thought of as plants that colonize the middle of an empty landscape. They

Ecologists studying the mountain's recovery (Charlie Crisafulli takes a pond's temperature) marvel at the role of chance.

THOMAS IRAGI / UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE; INSET: GARY BRAASCH / CORBIS

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Aricept is well tolerated but may not be for everyone. Some people may have nausea, diarrhea, not sleep well, or vomit. Some people may have muscle cramps, feel very tired, or may not want to eat. In studies, these side effects were usually mild and went away over time. People at risk for stomach ulcers or who take certain other medicines should tell their doctors because serious stomach problems, such as bleeding, may get worse. Some people who take Aricept may experience fainting.

Please see additional important product information on next page.

[1] IMS MAT/June/04 (MPFARI – June/04 database).

ARICEPT® (Donepezil Hydrochloride Tablets)

Brief Summary—see package insert for full prescribing information. **INDICATIONS AND USAGE** ARICEPT® is indicated for the treatment of mild to moderate dementia of the Alzheimer's type. **CONTRAINDICATIONS** ARICEPT® is contraindicated in patients with known hypersensitivity to donepezil hydrochloride or to piperidine derivatives. **WARNINGS** ***Anesthesia:*** ARICEPT®, as a cholinesterase inhibitor, is likely to exaggerate succinylcholine-type muscle relaxation during anesthesia. ***Cardiovascular Conditions:*** Because of their pharmacological action, cholinesterase inhibitors may have vagotonic effects on the sinoatrial and atrioventricular nodes. This effect may mani fest as bradycardia or heart block in patients both with and without known underlying cardiac conduction abnormalities. Syncopal episodes have been reported in association with the use of ARICEPT®. ***Gastrointestinal Conditions:*** Through their primary action, cholinesterase inhibitors may be expected to increase gastric acid secretion due to increased cholinergic activity. Therefore, patients should be monitored closely for symptoms of active or occult gastrointestinal bleeding, especially those at increased risk for developing ulcers, e.g., those with a history of ulcer disease or those receiving concurrent nonsteroidal anti-inflammatory drugs (NSAIDS). Clinical studies of ARICEPT® have shown no increase, relative to placebo, in the incidence of either peptic ulcer disease or gastrointestinal bleeding. ARICEPT®, as a predictable consequence of its pharmacological properties, has been shown to produce diarrhea, nausea and vomiting. These effects, when they occur, appear more frequently with the 10 mg/day dose than with the 5 mg/day dose. In most cases, these effects have been mild and transient, sometimes lasting one to three weeks, and have resolved during continued use of ARICEPT®. ***Genitourinary:*** Although not observed in clinical trials of ARICEPT®, cholinomimetics may cause bladder outflow obstruction. ***Neurological Conditions:*** Seizures: Cholinomimetics are believed to have some potential to cause generalized convulsions. However, seizure activity also may be a manifestation of Alzheimer's Disease. ***Pulmonary Conditions:*** Because of their cholinomimetic actions, cholinesterase inhibitors should be prescribed with care to patients with a history of asthma or obstructive pulmonary disease. **PRECAUTIONS Drug-Drug Interactions** (see Clinical Pharmacology: Clinical Pharmacokinetics: Drug-drug Interactions) ***Effect of ARICEPT® on the Metabolism of Other Drugs:*** No *in vivo* clinical trials have investigated the effect of ARICEPT® on the clearance of drugs metabolized by CYP 3A4 (e.g. cisapride, terfenadine) or by CYP 2D6 (e.g. imipramine). However, *in vitro* studies show a low rate of binding to these enzymes (mean K_i about 50-130 µM), that, given the therapeutic plasma concentrations of donepezil (164 nM), indicates little likelihood of interference. Whether ARICEPT® has any potential for enzyme induction is not known. Formal pharmacokinetic studies evaluated the potential of ARICEPT® for interaction with theophylline, cimetidine, warfarin, digoxin and ketoconazole. No effects of ARICEPT® on the pharmacokinetics of these drugs were observed. ***Effect of Other Drugs on the Metabolism of ARICEPT®:*** Ketoconazole and quinidine, inhibitors of CYP450, 3A4 and 2D6, respectively, inhibit donepezil metabolism *in vitro*. Whether there is a clinical effect of quinidine is not known. In a 7-day crossover study in 18 healthy volunteers, ketoconazole (200 mg q.d.) increased mean donepezil (5 mg q.d.) concentrations (AUC_{0-24} and C_{max}) by 36%. The clinical relevance of this increase in concentration is unknown. Inducers of CYP 2D6 and CYP 3A4 (e.g., phenytoin, carbamazepine, dexamethasone, rifampin, and phenobarbital) could increase the rate of elimination of ARICEPT®. Formal pharmacokinetic studies demonstrated that the metabolism of ARICEPT® is not significantly affected by concurrent administration of digoxin or cimetidine. ***Use with Anticholinergics:*** Because of their mechanism of action, cholinesterase inhibitors have the potential to interfere with the activity of anticholinergic medications. ***Use with Cholinomimetics and Other Cholinesterase Inhibitors:*** A synergistic effect may be expected when cholinesterase inhibitors are given concurrently with succinylcholine, similar neuromuscular blocking agents or cholinergic agonists such as bethanechol. **Carcinogenesis, Mutagenesis, Impairment of Fertility** No evidence of a carcinogenic potential was obtained in an 88-week carcinogenicity study of donepezil hydrochloride conducted in CD-1 mice at doses up to 180 mg/kg/day (approximately 90 times the maximum recommended human dose on a mg/m^2 basis), or in a 104-week carcinogenicity study in Sprague-Dawley rats at doses up to 30 mg/kg/day (approximately 30 times the maximum recommended human dose on a mg/m^2 basis). Donepezil was not mutagenic in the Ames reverse mutation assay in bacteria,or in a mouse lymphoma forward mutation assay *in vitro*. In the chromosome aberration test in cultures of Chinese hamster lung (CHL) cells, some clastogenic effects were observed. Donepezil was not clastogenic in the *in vivo* mouse micronucleus test and was not genotoxic in an *in vivo* unscheduled DNA synthesis assay in rats. Donepezil had no effect on fertility in rats at doses up to 10 mg/kg/day (approximately 8 times the maximum recommended human dose on a mg/m^2 basis). **Pregnancy** ***Pregnancy Category C:*** Teratology studies conducted in pregnant rats at doses up to 16 mg/kg/day (approximately 13 times the maximum recommended human dose on a mg/m^2 basis) and in pregnant rabbits at doses up to 10 mg/kg/day (approximately 16 times the maximum recommended human dose on a mg/m^2 basis) did not disclose any evidence for a teratogenic potential of donepezil. However, in a study in which pregnant rats were given up to 10 mg/kg/day (approximately 8 times the maximum recommended human dose on a mg/m^2 basis) from day 17 of gestation through day 20 postpartum, there was a slight increase in still births and a slight decrease in pup survival through day 4 postpartum at this dose; the next lower dose tested was 3 mg/kg/day. There are no adequate or well-controlled studies in pregnant women. ARICEPT® should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. **Nursing Mothers** It is not known whether donepezil is excreted in human breast milk. ARICEPT® has no indication for use in nursing mothers. **Pediatric Use** There are no adequate and well-controlled trials to document the safety and efficacy of ARICEPT® in any illness occurring in children. **Geriatric Use** Alzheimer's disease is a disorder occurring primarily in individuals over 55 years of age. The mean age of the patients enrolle d in the clinical studies with ARICEPT® was 73 years; 80% of these patients were between 65 and 84 years old and 49% of the patients were at or above the age of 75. The efficacy and safety data presented in the clinical trials section were obtained from these patients. There were no clinically significant differences in most adverse events reported by patient groups ≥65 years old and <65 years old. **ADVERSE REACTIONS Adverse Events Leading to Discontinuation** The rates of discontinuation from controlled clinical trials of ARICEPT® due to adverse events for the ARICEPT® 5 mg/day treatment groups were comparable to those of placebo-treatment groups at approximately 5%. The rate of discontinuation of patients who received 7-day escalations from 5 mg/day to 10 mg/day, was higher at 13%. The most common adverse events leading to discontinuation, defined as those occurring in at least 2% of patients and at twice the incidence seen in placebo patients, are shown in Table 1.

Table 1. Most Frequent Adverse Events Leading to Withdrawal from Controlled Clinical Trials by Dose Group

Dose Group	Placebo	5 mg/day ARICEPT®	10 mg/day ARICEPT®
Patients Randomized Event/% Discontinuing	355	350	315
Nausea	1%	1%	3%
Diarrhea	0%	<1%	3%
Vomiting	<1%	<1%	2%

Most Frequent Adverse Clinical Events Seen in Association with the Use of ARICEPT® The most common adverse events, defined as those occurring at a frequency of at least 5% in patients receiving 10 mg/day and twice the placebo rate, are largely predicted by ARICEPT®'s cholinomimetic effects. These include nausea, diarrhea, insomnia, vomiting, muscle cramp, fatigue and anorexia. These adverse events were often of mild intensity and transient, resolving during continued ARICEPT® treatment without the need for dose modification. There is evidence to suggest that the frequency of these common adverse events may be affected by the rate of titration. An open-label study was conducted with 269 patients who received placebo in the 15 and 30-week studies. These patients were titrated to a dose of 10 mg/day over a 6-week period. The rates of common adverse events were lower than those seen in patients titrated to 10 mg/day over one week in the controlled clinical trials and were comparable to those seen in patients on 5 mg/day. See Table 2 for a comparison of the most common adverse events following one and six week titration regimens.

Table 2. Comparison of Rates of Adverse Events in Patients Titrated to 10 mg/day Over 1 and 6 Weeks

	No titration		One week titration	Six week titration
Adverse Event	**Placebo (n=315)**	**5 mg/day (n=311)**	**10 mg/day (n=315)**	**10 mg/day (n=269)**
Nausea	6%	5%	19%	6%
Diarrhea	5%	8%	15%	9%
Insomnia	6%	6%	14%	6%
Fatigue	3%	4%	8%	3%
Vomiting	3%	3%	8%	5%
Muscle cramps	2%	6%	8%	3%
Anorexia	2%	3%	7%	3%

Adverse Events Reported in Controlled Trials The events cited reflect experience gained under closely monitored conditions of clinical trials in a highly selected patient population. In actual clinical practice or in other clinical trials, these frequency estimates may not apply, as the conditions of use, reporting behavior, and the kinds of patients treated may differ. Table 3 lists treatment emergent signs and symptoms that were reported in at least 2% of patients in placebo-controlled trials who received ARICEPT® and for which the rate of occurrence was greater for ARICEPT® assigned than placebo assigned patients. In general, adverse events occurred more frequently in female patients and with advancing age.

Table 3. Adverse Events Reported in Controlled Clinical Trials in at Least 2% of Patients Receiving ARICEPT® and at a Higher Frequency than Placebo-treated Patients

Body System/Adverse Event	Placebo (n=355)	ARICEPT® (n=747)
Percent of Patients with any Adverse Event	**72**	**74**
Body as a Whole		
Headache	9	10
Pain, various locations	8	9
Accident	6	7
Fatigue	3	5
Cardiovascular System		
Syncope	1	2
Digestive System		
Nausea	6	11
Diarrhea	5	10
Vomiting	3	5
Anorexia	2	4
Hemic and Lymphatic System		
Ecchymosis	3	4
Metabolic and Nutritional Systems		
Weight Decrease	1	3
Musculoskeletal System		
Muscle Cramps	2	6
Arthritis	1	2
Nervous System		
Insomnia	6	9
Dizziness	6	8
Depression	<1	3
Abnormal Dreams	0	3
Somnolence	<1	2
Urogenital System		
Frequent Urination	1	2

Other Adverse Events Observed During Clinical Trials ARICEPT® has been administered to over 1700 individuals during clinical trials worldwide. Approximately 1200 of these patients have been treated for at least 3 months and more than 1000 patients have been treated for at least 6 months. Controlled and uncontrolled trials in the United States included approximately 900 patients. In regards to the highest dose of 10 mg/day, this population includes 650 patients treated for 3 months, 475 patients treated for 6 months and 116 patients treated for over 1 year. The range of patient exposure is from 1 to 1214 days. Treatment emergent signs and symptoms that occurred during 3 controlled clinical trials and two open-label trials in the United States were recorded as adverse events by the clinical investigators using terminology of their own choosing. To provide an overall estimate of the proportion of individuals having similar types of events, the events were grouped into a smaller number of standardized categories using a modified COSTART dictionary and event frequencies were calculated across all studies. These categories are used in the listing below. The frequencies represent the proportion of 900 patients from these trials who experienced that event while receiving ARICEPT®. All adverse events occurring at least twice are included, except for those already listed in Tables 2 or 3, COSTART terms too general to be informative, or events less likely to be drug caused. Events are classified by body system and listed using the following definitions: *frequent adverse events*—those occurring in at least 1/100 patients; *infrequent adverse events*—those occurring in 1/100 to 1/1000 patients. These adverse events are not necessarily related to ARICEPT® treatment and in most cases were observed at a similar frequency in placebo-treated patients in the controlled studies. No important additional adverse events were seen in studies conducted outside the United States. **Body as a Whole:** *Frequent:* influenza, chest pain, toothache; *Infrequent:* fever, edema face, periorbital edema, hernia hiatal, abscess, cellulitis, chills, generalized coldness, head fullness, listlessness. **Cardiovascular System:** *Frequent:* hypertension, vasodilation, atrial fibrillation, hot flashes, hypotension; *Infrequent:* angina pectoris, postural hypotension, myocardial infarction, AV block (first degree), congestive heart failure, arteritis, bradycardia, peripheral vascular disease, supraventricular tachycardia, deep vein thrombosis. **Digestive System:** *Frequent:* fecal incontinence, gastrointestinal bleeding, bloating, epigastric pain; *Infrequent:* eructation, gingivitis, increased appetite, flatulence, periodontal abscess, cholelithiasis, diverticulitis, drooling, dry mouth, fever sore, gastritis, irritable colon, tongue edema, epigastric distress, gastroenteritis, increased transaminases, hemorrhoids, ileus, increased thirst, jaundice, melena, polydipsia, duodenal ulcer, stomach ulcer. **Endocrine System:** *Infrequent:* diabetes mellitus, goiter. **Hemic and Lymphatic System:** *Infrequent:* anemia, thrombocythemia, thrombocytopenia, eosinophilia, erythrocytopenia. **Metabolic and Nutritional Disorders:** *Frequent:* dehydration; *Infrequent:* gout, hypokalemia, increased creatine kinase, hyperglycemia, weight increase, increased lactate dehydrogenase. **Musculoskeletal System:** *Frequent:* bone fracture; *Infrequent:* muscle weakness, muscle fasciculation. **Nervous System:** *Frequent:* delusions, tremor, irritability, paresthesia, aggression, vertigo, ataxia, increased libido, restlessness, abnormal crying, nervousness, aphasia; *Infrequent:* cerebrovascular accident, intracranial hemorrhage, transient ischemic attack, emotional lability, neuralgia, coldness (localized), muscle spasm, dysphoria, gait abnormality, hypertonia, hypokinesia, neurodermatitis, numbness (localized), paranoia, dysarthria, dysphasia, hostility, decreased libido, melancholia, emotional withdrawal, nystagmus, pacing. **Respiratory System:** *Frequent:* dyspnea, sore throat, bronchitis; *Infrequent:* epistaxis, post nasal drip, pneumonia, hyperventilation, pulmonary congestion, wheezing, hypoxia, pharyngitis, pleurisy, pulmonary collapse, sleep apnea, snoring. **Skin and Appendages:** *Frequent:* pruritus, diaphoresis, urticaria; *Infrequent:* dermatitis, erythema, skin discoloration, hyperkeratosis, alopecia, fungal dermatitis, herpes zoster, hirsutism, skin striae, night sweats, skin ulcer. **Special Senses:** *Frequent:* cataract, eye irritation, vision blurred; *Infrequent:* dry eyes, glaucoma, earache, tinnitus, blepharitis, decreased hearing, retinal hemorrhage, otitis externa, otitis media, bad taste, conjunctival hemorrhage, ear buzzing, motion sickness, spots before eyes. **Urogenital System:** *Frequent:* urinary incontinence, nocturia; *Infrequent:* dysuria, hematuria, urinary urgency, metrorrhagia, cystitis, enuresis, prostate hypertrophy, pyelonephritis, inability to empty bladder, breast fibroadenosis, fibrocystic breast, mastitis, pyuria, renal failure, vaginitis. **Postintroduction Reports** Voluntary reports of adverse events temporally associated with ARICEPT® that have been received since market introduction that are not listed above, and that there is inadequate data to determine the causal relationship with the drug include the following: abdominal pain, agitation, cholecystitis, confusion, convulsions, hallucinations, heart block (all types), hemolytic anemia, hepatitis, hyponatremia, neuroleptic malignant syndrome, pancreatitis, and rash. **OVERDOSAGE Because strategies for the management of overdose are continually evolving, it is advisable to contact a Poison Control Center to determine the latest recommendations for the management of an overdose of any drug.** As in any case of overdose, general supportive measures should be utilized. Overdosage with cholinesterase inhibitors can result in cholinergic crisis characterized by severe nausea, vomiting, salivation, sweating, bradycardia, hypotension, respiratory depression, collapse and convulsions. Incr easing muscle weakness is a possibility and may result in death if respiratory muscles are involved. Tertiary anticholinergics such as atropine may be used as an antidote for ARICEPT® overdosage. Intravenous atropine sulfate titrated to effect is recommended: an initial dose of 1.0 to 2.0 mg IV with subsequent doses based upon clinical response. Atypical responses in blood pressure and heart rate have been reported with other cholinomimetics when co-administered with quaternary anticholinergics such as glycopyrrolate. It is not known whether ARICEPT® and/or its metabolites can be removed by dialysis (hemodialysis, peritoneal dialysis, or hemofiltration). Dose-related signs of toxicity in animals included reduced spontaneous movement, prone position, staggering gait, lacrimation, clonic convulsions, depressed respiration, salivation, miosis, tremors, fasciculation and lower body surface temperature. **DOSAGE AND ADMINISTRATION** The dosages of ARICEPT® shown to be effective in controlled clinical trials are 5 mg and 10 mg administered once per day. The higher dose of 10 mg did not provide a statistically significantly greater clinical benefit than 5 mg. There is a suggestion, however, based upon order of group mean scores and dose trend analyses of data from these clinical trials, that a daily dose of 10 mg of ARICEPT® might provide additional benefit for some patients. Accordingly, whether or not to employ a dose of 10 mg is a matter of prescriber and patient preference. Evidence from the controlled trials indicates that the 10 mg dose, with a one week titration, is likely to be associated with a higher incidence of cholinergic adverse events than the 5 mg dose. In open label trials using a 6 week titration, the frequency of these same adverse events was similar between the 5 mg and 10 mg dose groups. Therefore, because steady state is not achieved for 15 days and because the incidence of untoward effects may be influenced by the rate of dose escalation, treatment with a dose of 10 mg should not be contemplated until patients have been on a daily dose of 5 mg for 4 to 6 weeks. ARICEPT® should be taken in the evening, just prior to retiring. ARICEPT® can be taken with or without food. **HOW SUPPLIED** ARICEPT® is supplied as film-coated, round tablets containing either 5 mg or 10 mg of donepezil hydrochloride. The 5 mg tablets are white. The strength, in mg (5), is debossed on one side and ARICEPT is debossed on the other side. The 10 mg tablets are yellow. The strength, in mg (10), is debossed on one side and ARICEPT is debossed on the other side. 5 mg (White): Bottles of 30 (NDC# 62856-245-30), Bottles of 90 (NDC# 62856-245-90), Unit Dose Blister Package 100 (10x10) (NDC# 62856-245-41). 10 mg (Yellow): Bottles of 30 (NDC# 62856-246-30), Bottles of 90 (NDC# 62856-246-90), Unit Dose Blister Package 100 (10x10) (NDC# 62856-246-41). **Storage:** Store at controlled room temperature, 15°C to 30°C (59°F to 86°F).

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Eisai Inc. Teaneck, NJ 07666

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spread slowly, hug the ground, and have heavy seeds not easily borne on the wind. But in June 1982, Crisafulli and another ecologist, surveying the Pumice Plain by helicopter, spotted the first plant they'd seen for miles. They landed and found a flowering lupine, surrounded by a ring of seedlings. The deep ash and pumice held few nutrients, but lupines, like other plants in the pea family, get nitrogen from bacteria that live on their roots. Crisafulli established a 200-square-yard study plot around that pioneering plant. Within four years, he counted 16,000 lupines in the plot; three years later, 35,000. "People sometimes ask me how I can go back and study the exact same place year after year," he says. "I always tell them it's never the same."

The flourishing of life on the Pumice Plain may have begun with that lone lupine. Once the plants enriched the soil with nitrogen, adding organic material to it when they died, other plants and then animals soon followed. Within a decade of the eruption, Crisafulli had documented more than 27 plant species in the study plot. A large patch of strawberries sprang up just outside it, probably from a single seed deposited in bird or mammal feces. Crisafulli has trapped 11 species of small mammals on the Pumice Plain, including ground squirrels, mice and shrews. Each has sped up the area's recovery by caching seeds, burrowing through soil and luring predators such as raptors and weasels.

Like many other discoveries on Mount St. Helens, "the return of these small [animal] species flies in the face of conventional wisdom," says Crisafulli. Ecologists once thought that many small mammals stick to tried-and-true routes amid dense vegetation that provides good hiding. But he started finding deer mice in the Pumice Plain in 1982, well before many plants had taken root. Now researchers know that even shrews weighing less than one-fifth of an ounce are hardy explorers that cross miles of barren terrain.

The great eruption had some other surprising effects on the balance of life in the rest of the region. "Be careful where you step as we approach the lake," says Crisafulli. At first I don't understand the warning; the terrain is level and we are walking on a four-foot-wide path. But then the ground seems to move. I look closer. Tiny, dark western toadlets hop everywhere. At this lake, thousands of them pulsate in piles along the water's edge.

As luck (for the toads) would have it, the amphibians are abundant here because they happened to be hibernating underground when the volcano exploded in 1980. By the time the animals emerged a month or so later, the eruption had blasted down all the trees around the lake. More sunlight hit the water, making it unusually warm and especially rich in the aquatic organisms toads feed on. The blast also killed off most of the toads' predators. Intriguingly, the western toad is declining in most of its range beyond Mount St. Helens. "It may be a species that prospers with disturbance," says Crisafulli, "which no one had suspected."

Toads here, shrews there—the scattering of volcano survivors and opportunists suggests that the return of life occurs simultaneously in thousands of places at once, says Jerry Franklin an ecologist at the University of Washington in Seattle. The lesson applies to other damaged ecosystems, he says. Loggers shouldn't clear-cut the land, for instance, but instead leave behind "lifeboats" such as snags and living trees that will sustain other organisms and foster recovery.

Mount St. Helens' recovery has had many setbacks since the 1980 eruption. Stream erosion washed away some of the research plots. Landslides buried emerging forests. And other eruptions unleashed devastating pyroclastic flows. This past fall, Mount St. Helens erupted for the first time since 1986, sending up a cloud of steam and ash. The rumblings have continued unabated, but Crisafulli and Dale don't mind. They welcome disturbances.

DAVID B. WILLIAMS, a former park ranger, is the author of The Street-Smart Naturalist: Field Notes from Seattle.

At first I don't understand the warning. But then the ground seems to move.

Scientists thought they knew which plants would colonize devastated landscapes. Lupine (purple flowers in foreground, right) wasn't supposed to be one of them.

PHILIP JAMES CORWIN / CORBIS; GARY BRAASCH

Someone should make hydrogen vehicles and their refueling stations a reality. Only GM could.
Only General Motors has teamed up with Shell to introduce the nation's first hydrogen refueling pump at a retail station. It's the endgame of a multi-faceted strategy GM set in motion years ago to make cleaner cars and trucks powered by hydrogen. Right now, a test fleet of hydrogen-powered GM vehicles

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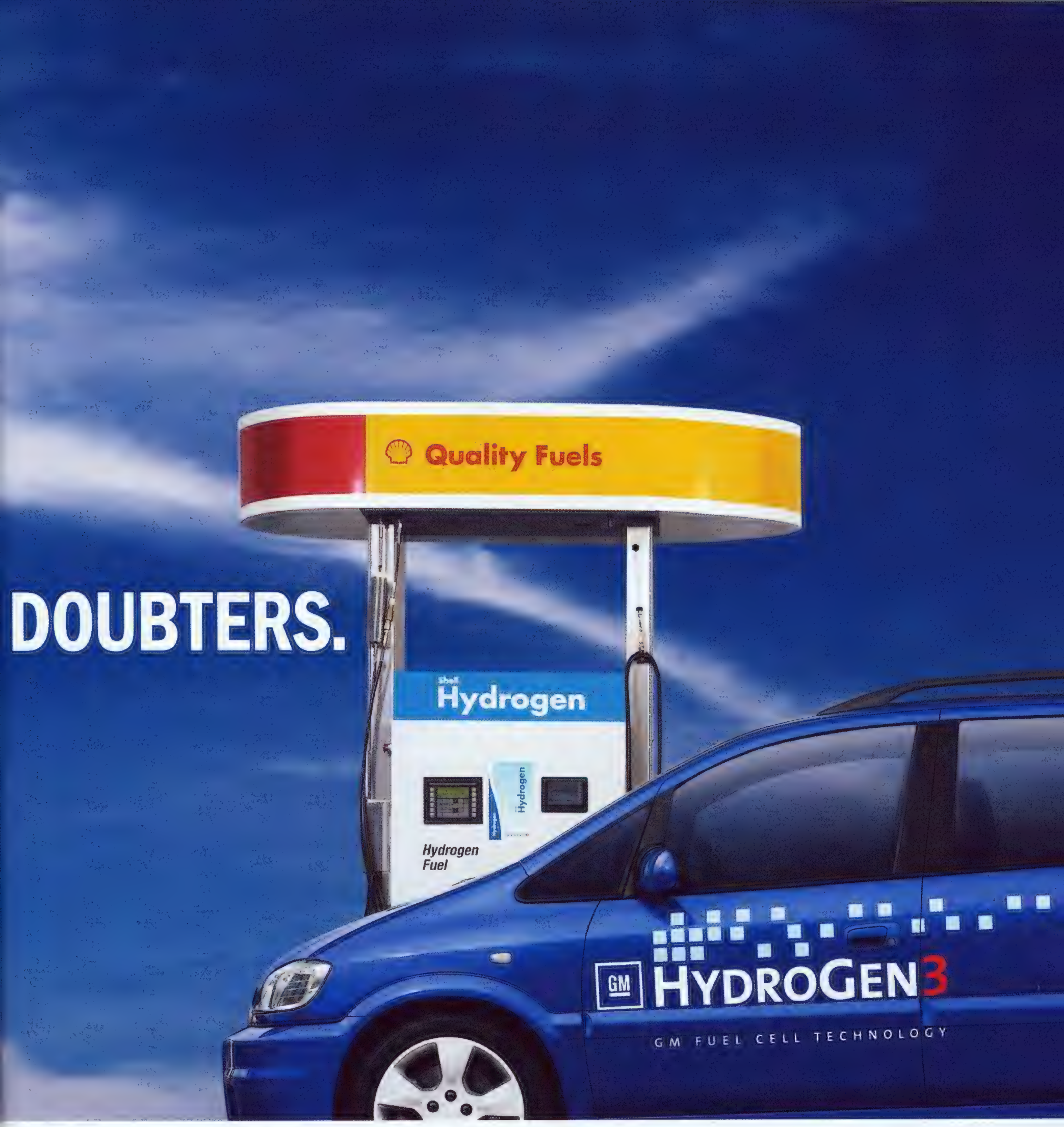

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CASUALTY OF WAR

A SCULPTOR'S PROVOCATIVE MEMORIAL ACKNOWLEDGES THE HIGH COST OF CONFLICT **BY OWEN EDWARDS**

[Warrior's Leg, *1966-67*
HIRSHHORN MUSEUM AND SCULPTURE GARDEN]

Paul Thek's piece pays homage to cruel losses sustained on a battlefield of the artist's imagining.

LEE STALSWORTH / HIRSHHORN MUSEUM AND SCULPTURE GARDEN, SMITHSONIAN INSTITUTION

IN VENICE, on the square in front of the grand Dominican Church of Saints John and Paul (Zannipoli, in the Venetian dialect), stands a colossal bronze statue of a 15th-century military leader, Bartolomeo Colleoni, a mercenary who led the republic's land forces when the city was at the height of its power. If it were not for the fact that Venice has few outdoor sculptures devoted to military figures, the looming equestrian statue would not be remarkable, as it is not much different from the thousands of other military statues that stand tall (or tall in the saddle) in most of the world's cities. In New York, on the slope of a hill in Central Park, Jagiello, a 15th-century Polish king and scourge of the Teutonic Knights, rises in the stirrups of his armored war horse, crossing two broadswords dramatically over his helmeted head, while half a mile away, just across from the Plaza Hotel, a serenely untroubled William Tecumseh Sherman, also on horseback, is led into posterity by a female figure representing Victory. This is what most military statuary is like: representations of glory and valor, the heroic and the hallowed. The hell of war knowingly spoken of by Sherman, the ghastly reality of death and dismemberment, are generally not what the commissioners of memorials require of sculptors.

On rare occasions, artists and city fathers agree that loss must be acknowledged, especially after a war, or a battle, that goes badly. In the small German town of Dottingen, near the Black Forest, a somber stone cross behind

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an empty helmet silently honors World War II dead from that village. On one of the most famous of all war monuments, Maya Lin's elegantly somber Vietnam Wall, names carved into polished black stone memorialize the dead. These memorials, and others like them, are not definitively antiwar statements—certainly Lin's masterpiece is meant also to do honor, not to protest—yet their designers and sculptors chose not to celebrate the glory and grandiosity that have been key to selling the idea of war for millennia.

In the collection of the Hirshhorn Museum, a strange, haunting sculpture also looks past the pomp of power to the circumstance of battle. The American artist Paul Thek completed the piece *Warrior's Leg* between 1966 and 1967. Encased in a Lucite box reminiscent of reliquaries that contain the bones of saints, the sculpture made of wood, wax, leather, metal and paint depicts, with startling realism, the calf and foot of a soldier from the age of the Roman Empire, hacked off at the knee.

Thek (pronounced "Tek") possessed a wide range of technical skills and an even wider range of aesthetic interests and intellectual concerns. His work was often in advance even of the avant-garde of the time, and though he sold some paintings and sculptures, he never enjoyed much success in his lifetime. (He died of AIDS at age 55 in 1988.) This may have been due in part to difficult, sometimes off-putting subject matter. But Thek himself was difficult, according to Carolyn Alexander of the New York gallery Alexander and Bonin, which represents his work: "Thek was not the easiest person, and his gallery relationships often foundered." Alexander's partner, Ted Bonin, elaborates: "He didn't really care if the art world liked his work, or liked him."

Better known in Europe than in his own country, Thek was a keen observer of popular culture and its symbiotic technologies. "I'm extremely interested in using and painting the new images of our time," he wrote in 1963, "particularly those of television and the cinema. The images themselves, when transposed, offer a rich, and for me, an exciting source of what I consider a new mythology." For example, during the early 1960s, Thek painted a series of TV screens—he called them "Television Analyzations"—that were at once ordinary and mysterious, iconic and ironic. In one, a woman's lips are shown in close-up above a pearl necklace, as if prefiguring the allure of the shopping channels.

Thek was particularly fascinated by reliquaries—he fabricated boxes around such odd bits of anthropological detritus as false teeth and a birthday cake. The *Warrior's Leg*, and a similarly realistic arm (also at the Hirshhorn), are what some critics called his "meat pieces." Many of these are realistic depictions of slabs of raw beef in transparent boxes, or, in one wry example, in a Brillo box of the kind made famous by Andy Warhol.

One hallmark of an exceptional work of art is its ability to remain relevant. The countless statues that celebrate great victories and honor heroes of wars past stir the emotions of those who remember those wars, but as time and generations pass, their power wanes. From dramas of life and death, to the vivid memories promised by Shakespeare's *Henry V*, to the cool appraisals of history books, gradually but inevitably, all wars, and the battles that decide their outcomes, recede toward that distant plain on which the Aecheans vanquished Troy. We look at the larger-than-life statues of warriors whose names once stiffened the spines and lifted the hearts of all who heard them, and somehow they are just statues, no longer much more than bronze or marble. But in Thek's sad, disembodied leg, left on some ancient field of the artist's imagining, we see a monument that despite its ancient trappings, defies time. This is an unsentimental memorial to horror and loss—war's unrelenting companions—a grim reminder that even as the bands play on, some will no longer march.

"Paul Thek didn't really care if the art world liked his work, or liked him."

Thek (at work in his New York City studio, 1967) sought to create "a new mythology."

ESTATE OF PETER HUJAR, NEW YORK

OWEN EDWARDS is executive editor of Edutopia, *the magazine for the George Lucas Educational Foundation in San Rafael, Calif.*

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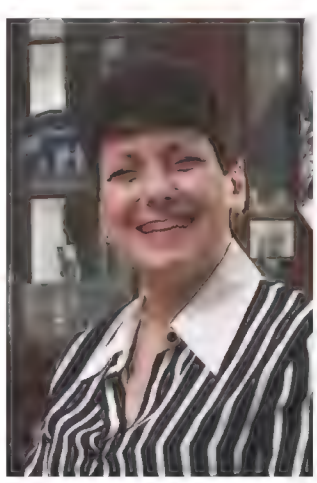
Being a poster child was like a Hollywood experience, recalls Carol Boyer (below), who was 5 in 1955 when she met Vice President Nixon at a March of Dimes publicity event.

OVERCOMING POLIO

FIFTY YEARS AFTER JONAS SALK'S SUCCESSFUL VACCINE, A NEW EXHIBITION TRACES THE DISEASE IN U.S. HISTORY, INCLUDING ITS IMPACT ON CHILDREN WHOSE LIVES WOULD NEVER BE THE SAME

NEARLY HALF A MILLION children and adults contracted polio in the United States before medical researchers announced, 50 years ago last month, that Jonas Salk and his co-workers had developed the first successful vaccine to prevent the disease. The National Museum of American History exhibition "Whatever Happened to Polio?" explores the social, cultural and political impacts of the affliction, now nearly faded from American memory. We spoke with a few people whose experiences transformed their lives.



CAROL BOYER contracted polio at age 3 in 1952. Two years later, the Washington, D.C. youngster's picture was featured on a March of Dimes poster: "I was getting out of bed to go to the bathroom and my legs went out from under me. I crawled to my parents' room and they rushed me to the hospital. I was there for six months, going through hours of physical therapy. I had to sleep with my feet strapped to a board with shoes on them so I wouldn't walk pigeon-toed. Those of us who survived polio

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feel like we wear our own badge of courage. Being a poster child was this Hollywood-like experience. One day the March of Dimes press people brought a tiny red convertible around . . . and I got my picture taken with Vice President Nixon at a gas station. He pumped gas for other people's cars and spilt gas on his trousers. I was so excited to meet someone famous."

Today, Boyer, 55, works in the Civil Rights Division of the U.S. Department of Justice fielding questions about the Americans with Disabilities Act.

CYNDI JONES contracted polio in 1954 when she was almost 3. She was appalled three years later when a photograph of her wearing leg braces appeared on a St. Louis flier and was labeled "Not This," to spur parents to vaccinate their children. "In an instant," she recalls, "I understood: this was how society views disability. I thought, I'm cute, I'm smart, why wouldn't someone want to be like me? As a child who had become disabled early, I didn't see anything wrong with having a disability. It was just who I was. A lot of public health and charity campaigns employ what I term negative use of disability. I think those kinds of campaigns for prevention should be outlawed."

Jones: "I didn't see anything wrong with having a disability" (inset, at age 5).

Jones, 53, is the director of the Center for an Accessible Society in San Diego, which provides information about disability issues to the news media.

PETER SALK was 9 when his father tested his still-experimental vaccine on himself, his wife and his three young sons in their Wexford, Pennsylvania, kitchen: "I was a kid who didn't enjoy injections, to put it mildly. I would object, defer and delay as much as possible. But I had total trust in him; he had something that he knew worked and he wanted his kids protected. He was absolutely dedicated. [But] he was not a person who was bent on achieving something on a personal level. He saw that there was a need, and he did everything in his power to meet that need. I remember having this thought when I was standing in the kitchen that my father was an important person in the world. My life started to change. I couldn't fade into the woodwork. I never could be anonymous. I never could be entirely myself."

Salk: "I didn't enjoy injections" (inset, at age 11), "but I trusted my father."

Salk, 61, is scientific director of the Jonas Salk Foundation, in La Jolla, which develops programs addressing global health problems such as AIDS.

—ANNE BOLEN

See the on-line exhibit at: http://americanhistory.si.edu/polio

HURRY IN

Playing what one critic called a "slangy, come-hither" beauty in *Carmen Jones* (1954), Dorothy Dandridge was the first African-American to earn an Oscar nomination for Best Actress. Through Aug. 28, ninety posters trace black cinematic history at the Smithsonian's International Gallery in Washington, D.C.

MARC LIEBERMAN / SALK INSTITUTE; GEORGE SKADDING / TIME LIFE PICTURE / GETTY IMAGES; CYNDI JONES COLLECTION; MARCH OF DIMES; ACADEMY OF MOTION PICTURE ARTS AND SCIENCES, MARGARET HERRICK LIBRARY (2)

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FLYING HIGH

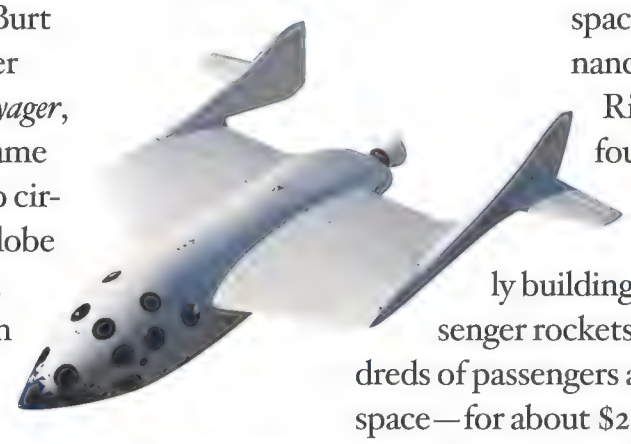
The winner of an out-of-this-world race, *SpaceShipOne* will land this summer at the National Air and Space Museum

"WHEN THAT SUNNY, blue sky just suddenly turns to black, that was the biggest thrill," says pilot Michael Melvill, who flew into space last September in the world's first civilian-built and financed rocket ship, *SpaceShipOne*. "It takes a few minutes for your eyes to adjust, but then you can see the planets and the stars."

This past March, *SpaceShipOne*'s owners donated the craft to the Smithsonian's National Air and Space Museum, where it will eventually hang alongside Charles Lindbergh's *Spirit of St. Louis* and the Bell X-1 that broke the sound barrier with Chuck Yeager at the controls.

Melvill's fantastic voyage, and pilot Brian Binnie's flight five days later, captured the $10 million Ansari X-PRIZE, initially offered in 1996 to the first private citizen to build a spaceship capable of carrying a pilot and two passengers to the edge of space and back twice in two weeks. (Some 400 pounds of lead shot ballast simulated the weight of the two passengers.) "The government was not going to take the necessary risks to move the space program forward," says St. Louis entrepreneur Peter Diamandis, founder of the X-PRIZE. "Not even corporations would take the risks. It was going to be up to the individual."

SpaceShipOne's prime mover was Burt Rutan, the engineer who developed *Voyager*, which in 1986 became the first airplane to circumnavigate the globe on one tank of gas. With backing from Paul G. Allen, the software billionaire, Rutan's California-based company, Scaled Composites, created the reusable 3,000-pound carbon-fiber craft. A specially built plane carried *SpaceShipOne* to about 50,000 feet and let go, at which time the craft's rocket engine ignited and the ship blasted briefly into space—defined as 100 kilometers, or 62.5 miles, above sea level. It then fell, spiraling back to Earth, and landed like a glider on a runway.



Michael Melvill was the first to pilot *SpaceShipOne* (below), carried aloft by a custom aircraft (above left).

To many observers, the real wonder is that the feat was done relatively cheaply: Rutan spent less than $25 million on the entire *SpaceShipOne* program. By comparison, NASA spent about $1.3 billion (in today's dollars) to launch the X-15, the reusable jet rocket that first reached space in 1959. "Everything Rutan does has an element of genius to it," says Valerie Neal, curator of space history at the Air and Space Museum.

Among *SpaceShipOne*'s innovations is an engine that burns nitrous oxide, or laughing gas, and rubber—a less expensive and less dangerous mix than the liquid hydrogen and oxygen that fuel the space shuttle's engines. The movable wing and tail assembly slows the craft as it reenters Earth's atmosphere. To eliminate the weight and expense of an automated flight control system, the pilot steers the old-fashioned way—with stick and rudder.

Next up for Rutan: space limos. With financing in part from Richard Branson, founder of Virgin Atlantic Airlines, Rutan is reportedly building several seven-passenger rockets to shuttle hundreds of passengers annually into space—for about $200,000 a seat (which includes preflight training), according to Branson. The proposed *SpaceShipTwo* faces obstacles, such as the 3Gs of force and the ear-shattering blast when the engine ignites and the rocket accelerates at Mach 3. "OK, yes," Melvill says, "that's a pretty stressful thing." Still, Branson says a passenger vehicle may be ready as soon as 2007.

"I know Rutan wants people to stay up a bit longer than I did," says Melvill, who floated gravity-free for about four minutes before completing his 90-minute round trip. "They will line up to do that. I know I would." Indeed, the BBC has reported that some 13,000 people have already signed up on-line.

—*MARY COLLINS*

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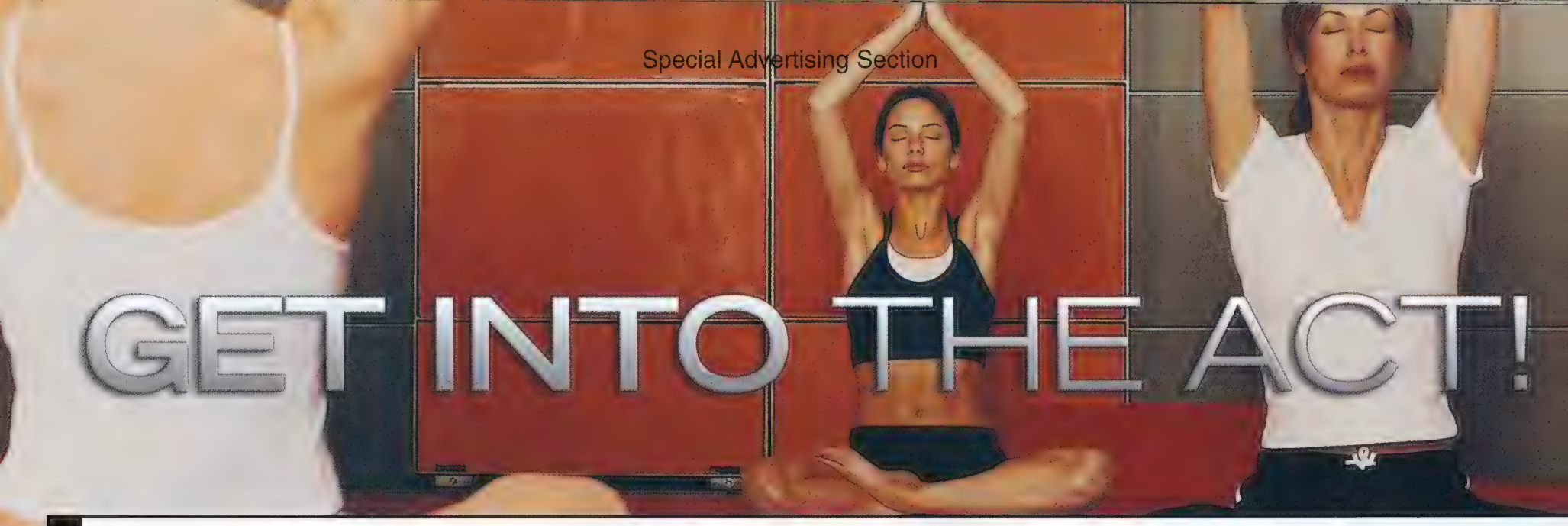

GET INTO THE ACT!

Physical activity is one of the most important things you can do for your health. Here are 10 tips on how to get in on the action — how to start and stick with an exercise program. *By John Hanc*

The "aha" moment, the instant that Dr. Steve Blair realized the true significance of his research on physical activity, came in 1989 as he was preparing to be interviewed on NBC's *Today* show.

Blair is president of the Cooper Institute — a Dallas-based research facility founded by Dr. Ken Cooper, the man who, in his best-selling books, coined the word "aerobics" and helped get millions of Americans off their duffs and into running, cycling and swimming regimens. In 1970, the Cooper Institute had begun tracking people who had come into their clinic for a periodic health exam. Their fitness levels were determined through a treadmill test during their visits, and their health and longevity was tracked in the years following the exam.

"You don't have to be a marathon runner to get benefits."
– Dr. Steve Blair

As time went on, Dr. Blair and his colleagues collected all kinds of information about these people (now up to 80,000), their habits and lifestyles. Some were marathon runners, ascetic in their devotion to health; others were sedentary folks who rarely moved farther than from the couch to the refrigerator. Still others, about 40 percent, were in between: They stayed active, mostly through walking and physical chores, but they weren't "exercisers" per se.

In 1989, Dr. Blair published a paper in the *Journal of the American Medical Association* about the value of exercise, based on some of what he had learned from these people. But, while rereading it prior to his *Today* show interview, he noticed something in the data. The "moderately fit" subjects — those who weren't athletes, but were physically active on a regular basis — had nearly the same longevity rates as the highly fit group. The light bulb went on over Dr. Blair's head. "I realized, 'my gosh, moderate physical activity is enough to improve health,'" he recalls. "You don't have to be a marathon runner to get benefits."

You get almost the same benefits from moderate, "lifestyle" activities as from a structured exercise regimen.

Subsequent studies have confirmed what Dr. Blair realized that day: Regular physical activity is now recognized as perhaps the single most important thing you can do for your health. What's more, you can accrue almost the same benefits from moderate, so-called "lifestyle" activities (walking, climbing stairs, gardening) as you can from a structured exercise regimen. Dr. Blair's research helped form the basis of the historic 1996 Surgeon General's report on exercise and physical activity, which recommended that Americans accumulate 30 minutes a day of physical activity. Slightly more — 45-60 minutes — may be necessary to prevent weight gain or maintain weight loss.

ACT NOW!

What daily physical activity can do for you

- Lower risk of heart disease, high blood pressure and diabetes
- Lower risk of colon cancer
- Less chance of flu and colds
- Better weight control
- Increased self-esteem and brighter mental outlook
- Stronger bones, joints and muscles
- Healthier and longer independent life

Source: The Cooper Institute

START ACTIVE LIVING

We all know that this is something we need to do, but how do we get into the habit of doing it? Based on further experiments, scientists at the Cooper Institute have come up with a plan for "active living." If you're someone who has had problems sticking with a traditional exercise program, if you don't like the gym or if you just can't seem to get started, consider this your call to action. Here are some tips on how to get moving:

Take Your Time:

Lack of time is cited by most people as the single biggest obstacle to exercise. So take a closer look at your time: Keep a log of what you do for one weekday and one weekend day. Add up all the sedentary time: Couldn't some of it… say, 10 of the 90 minutes you spend watching TV every night … be used for activity? It doesn't take much to make a difference.

The biggest health benefits are seen in those who go from doing nothing to something.

Discover the Power of a Two-Minute Walk:

Right now, get up and walk down the block or around the corridor for two minutes. Congratulations — you've already started on a program beneficial to your health. One of the most striking findings in the research done by Dr. Blair and others is that the biggest health benefits are seen in those who go from doing nothing to something.

Set Daily Goals:

Some people pick a time every day for exercise. But Dr. Blair suggests taking it day to day. Maybe tomorrow you can carve out 15 minutes for a walk before breakfast and another 15 to rake the leaves before dinner (remember — that 30 minutes a day can be cumulative). The day after, maybe you take a walk at lunchtime. The important thing is not *when* you do it; the important thing is that you *do* it!

Walk with a Friend (or man's best friend):

Studies have shown that people are more likely to stick with an exercise program if they get support from others. And those "others" don't necessarily have to be humans! A recent Northwestern University study found that people who exercise with their dogs are more successful at staying with a weight loss program. And of course, the benefits of daily walking aren't restricted to pet owners. "I like to say, walk the dog every day, even if you don't have one," Dr. Blair says.

Turn Errands Into Activities:

We don't really "run" errands anymore. We drive to them. "Day-to-day errands represent great opportunities for increasing your activity," Dr. Blair says. It just takes a little planning. So the post office is too far to walk? Okay, drive halfway but walk the rest.

To Keep It Up, Mix It Up:

There are lots of ways to accumulate your 30 minutes of daily recommended activity: Walking, gardening, household chores, not to mention the conventional forms of exercise such as bicycling, jogging, and weight lifting. The important thing is to be consistent. "Like brushing your teeth," Dr. Blair says, "you have to make exercise and activity a part of your life."

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Find Your Exercise "Pleasure Point":

A study done last year at Iowa State University found that beginners were surprisingly accurate when it came to predicting their level of exercise intensity. What did they base it on? A heart monitor? Some sophisticated lab testing? Nope. They knew when they were exercising too hard when it was no longer pleasurable.

"As astonishingly simple as it sounds," says lead researcher Dr. Paddy Ekkekakis, "the most appropriate level of exercise intensity is the intensity that does not feel unpleasant." Of course, physical exertion by definition requires effort (there's a reason they call it a workout). Still, this study suggests that when it comes to exercise, what feels good for us and what is good for us may be closely related. So while dispelling the old cliché of "no pain, no gain," the research gives new meaning to another hoary bit of exercise advice: Listen to your body. If it's saying, "I like this," you're on the right path to fitness.

Roll with the punches and don't let one missed activity session end your program.

Protect Your Skin:

A walk in the fresh air is just what the doctor ordered, but the doctor might also remind you about the dangers of overexposure to the sun. According to the American Academy of Dermatology, one in five Americans will develop skin cancer in their lifetime. To minimize the risk, the Academy recommends a few common sense procedures when you head out for your daily activity this summer:

- Use a broad-spectrum sunscreen with a SPF of at least 15 on all exposed skin, including the lips.
- Wear a broad-brimmed hat and sunglasses.
- Wear protective, tightly-woven clothing.
- Plan your activity to avoid peak sunlight hours (10a.m. – 4p.m.)

Don't Let a Lapse Lead to a Collapse:

When trying to change any kind of behavior, most people will experience a lapse. The key, says Toronto-based sport psychologist Dr. Kate Hays, author of *Move Your Body, Tone Your Mood,** is to roll with the punches and not let one missed activity session end your program. Think of the dieter who has one bite of chocolate cake and concludes, "it's all over now." It's not. But that kind of thinking may lead you in that direction. Instead of throwing your hands up in the air over one missed workout, put one foot in front of the other as soon as you can, and get yourself back on track.

Monitor Your Progress:

New exercisers are often advised to keep some kind of diary or training log. Why? "Keeping a record helps focus your attention on the behavior you are trying to change," says Dr. Blair. "And the more attention you're paying, the more likely you are to make those changes." If you're diligent about your record keeping, you'll be able to see your progress. You'll also be able to spot problems in your training. Bottom line: As the days and weeks go on, you'll be able to discern patterns. "You can use that information to set goals," Blair says, "then by continued monitoring you can determine your progress towards those goals."

John Hanc writes on health and fitness for *Newsday, Runner's World, Fitness, Men's Fitness* and other publications.

* Published by New Harbinger, $17.95

MORE TIPS...

For more tips, see *Active Living Every Day: 20 Steps to Lifelong Vitality.* Coauthored by Dr. Steve Blair and his colleagues at the Cooper Institute, the book is available through Human Kinetics for $24.95. Additional on-line material is available as well. Visit www.activeliving.info or call 800-747-4457.

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THIS MONTH IN HISTORY

MAY ANNIVERSARIES—MOMENTOUS OR MERELY MEMORABLE

60 YEARS AGO: IT WAS IN ALL THE PAPERS
Five and a half years after invading Poland, Germany surrenders to the Allies and the Soviet Union in Gen. Dwight Eisenhower's headquarters in a Reims, France, schoolhouse May 7, 1945. V-E Day, May 8, dawns with a euphoria tempered by an awareness of the job ahead; war will rage in the Pacific for four more months.

70 YEARS AGO: SMASH HIT
In a spectacle the *Los Angeles Times* calls a "homer orgy," Babe Ruth cracks out the last three home runs of his career, for a record of 714, May 25, 1935. Playing for the Boston Braves against the Pittsburgh Pirates, the 40-year-old "Sultan of Swat" hits the third run clear over the roof of Forbes Field—the first player ever to do so. The Braves lose the game, but Ruth's record stands—until Hank Aaron knocks out his 715th in 1974.

90 YEARS AGO: SUNK
A German U-boat off the Irish coast torpedoes the British liner *Lusitania* on May 7, 1915, causing explosions that dispatch the 32,000-ton vessel to the bottom. Despite German warnings to U.S. citizens not to travel on British ships, 128 Americans are among the 1,198 dead. Two years later, the United States, citing such acts of submarine aggression, joins in the fray that turns into World War I.

100 YEARS AGO: AMERICAN IDOL
Henry Fonda is born in Grand Island, Nebraska, May 16, 1905. While looking for work in journalism in 1925, he tries acting and, over the next 60 years, stars in more than 100 plays and films (*Mister Roberts*, 1955), playing men of quiet dignity. Patriarch of an actor family that includes children Jane and Peter and granddaughter Bridget, at his death at 77 in 1982 Fonda is remembered as "the man we wish lived next door."

230 YEARS AGO: SURPRISE VISIT
Ethan Allen and his "Green Mountain Boys"—a militia from Vermont—capture New York's Fort Ticonderoga from the British, May 10, 1775, in the first American victory of the Revolutionary War. Allen, working with future turncoat Benedict Arnold, takes the fort's skeleton garrison by surprise (news of the start of the war having yet to reach it), and quickly claims the fort's cannon, which Gen. George Washington will use in 1776 to force the British from Boston. Allen dies in 1789.

130 YEARS AGO: JULEPS, ANYONE?
Aristides, a 3-year-old colt, outruns 14 other Thoroughbreds to win the first Kentucky Derby, May 17, 1875. Ridden by African-American jockey Oliver Lewis, the colt covers 1 1/2 miles in a time of 2:37 3/4. Event founder Meriwether Lewis Clark (explorer William Clark's grandson) models the race at the Louisville Jockey Club—now called Churchill Downs—on England's Epsom Derby. The 131st derby will be run May 7, 2005.

—ALISON MCLEAN

CLOCKWISE TOP LEFT: BETTMANN / CORBIS; WARNER BROTHERS / ROBAL COLLECTION; HULTON ARCHIVE / GETTY IMAGES; GRANGER COLLECTION, NEW YORK; KINETIC CORPORATION / CHURCHILL DOWNS; AKG-IMAGES

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FIRE IN THE HOLE

RAGING IN MINES FROM PENNSYLVANIA TO CHINA, COAL FIRES THREATEN TOWNS, POISON AIR AND WATER, AND ADD TO GLOBAL WARMING

BY KEVIN KRAJICK

PHOTOGRAPHS BY ERICA FREUDENSTEIN

FROM THE BACK KITCHEN window of his little house on a ridge in east-central Pennsylvania, John Lokitis looks out on a most unusual prospect. Just uphill, at the edge of St. Ignatius Cemetery, the earth is ablaze. Vegetation has been obliterated along a quarter-mile strip; sulfurous steam billows out of hundreds of fissures and holes in the mud. There are pits extending perhaps 20 feet down: in their depths, discarded plastic bottles and tires have melted. Dead trees, their trunks bleached white, lie in tangled heaps, stumps venting smoke through hollow centers. Sometimes fumes seep across the cemetery fence to the grave of Lokitis' grandfather, George Lokitis.

This hellish landscape constitutes about all that remains of the once-thriving town of Centralia, Pennsylvania. Forty-three years ago, a vast honeycomb of coal mines at the edge of the town caught fire. An underground inferno has been spreading ever since, burning at depths of up to 300 feet, baking surface layers, venting poisonous gases and opening holes large enough to swallow people or cars. The conflagration may burn for another 250 years, along an eight-mile stretch encompassing 3,700 acres, before it runs out of the coal that fuels it.

Remarkably enough, nobody's doing a thing about it. The federal and state governments gave up trying to extinguish the fire in the 1980s. "Pennsylvania didn't have enough money in the bank to do the job," says Steve Jones, a geologist with the state's Office of Surface Mining. "If you aren't going to put it out, what can you do? Move the people." Nearly all 1,100 residents left after they were offered federally funded compensation for their properties. Their abandoned houses were leveled. Today Centralia exists only as an eerie grid of streets, its

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Stranded in a smoldering landscape, the east-central Pennsylvania coal town of Centralia (now largely abandoned, with only a handful of households, in background, remaining) was evacuated in the 1980s after underground fires blazed out of control.

John Lokitis (in his Centralia backyard, with parents Arlene and John Sr.) believes the fire will never reach his house: "I'm happy. I can't imagine being anywhere else."

driveways disappearing into vacant lots. Remains of a picket fence here, a chair spindle there—plus Lokitis and 11 others who refused to leave, the occupants of a dozen scattered structures. Lokitis, 35, lives alone in the house he inherited from "Pop"—his grandfather, a coal miner, as was Pop's father before him. For fans of the macabre, lured by a sign warning of DANGER from asphyxiation or being swallowed into the ground, Centralia has become a tourist destination. For Lokitis, it is home.

Across the globe, thousands of coal fires are burning. Nearly impossible to reach and extinguish once they get started, the underground blazes threaten towns and roads, poison the air and soil and, some say, worsen global warming. The menace is growing: mines open coal beds to oxygen; human-induced fires or spontaneous combustion provides the spark. The United States, with the world's largest coal reserves, harbors hundreds of blazes from Alaska to Alabama. Pennsylvania, the worst-afflicted state, has at least 38—an insignificant number compared with China (see sidebar, "Flaming Dragon," p. 58) and India, where poverty, old unregulated mining practices and runaway development have created waves of Centralias. "It's a worldwide catastrophe," says geologist Anupma Prakash of the University of Alaska at Fairbanks.

Writer KEVIN KRAJICK reports on science and the environment. Photographer ERICA FREUDENSTEIN is based in New York City.

Some of the underground fires are natural occurrences. When coal, exposed at or near the surface by erosion, combines with oxygen, a chemical reaction produces heat. That process can build for years; low-grade, soft coals—crumbly and low in carbon—can spontaneously combust, at temperatures as low as 104 degrees Fahrenheit. Lightning or a brush fire can also ignite soft coal. The fires burn downward, acquiring air through fissures in rock and microscopic spaces between grains of dirt. An underground fire may smolder for years, or even decades, without showing signs on the surface. Eventually, however, in a process called subsidence, burning subterranean coal turns to ash, creating huge underground voids and causing overlying ground to crack and collapse—thus allowing more air in, which fans more fire. Much of the landscape of the American West—its mesas and escarpments—is the result of vast, ancient coal fires. Those conflagrations formed "clinker"—a hard mass of fused stony matter. Surfaces formed in this way resist erosion far better than adjacent unfired ones, leaving clinker outcrops. Many ancient fires like those still burn, from the Canadian Arctic to southeast Australia. Scientists estimate that Australia's Burning Mountain, the oldest known coal fire, has burned for 6,000 years. In the 19th century, explorers mistook the smoking summit for a volcano.

Natural though the fires may be, humans intensify the scale. China, for example, supplies 75 percent of its energy with coal as it hurtles toward industrialization. Due to min-

At first, former Centralians Kathy and Bob Gadinski (standing where their house once did) weren't alarmed; the warming backyard meant tomatoes at Christmas.

ing of its vast coal fields, fires are spreading. Estimates vary, but some scientists believe that anywhere from 20 million to 200 million tons burn there each year, producing as much carbon dioxide as about 1 percent of the total carbon dioxide from fossil fuels burned on earth. Another human intensifier: rural Chinese people tend to hand-dig household coal from hundreds of thousands of surface locations, then abandon them when the cavities get too deep. The practice leaves the earth punctured by countless small pits; inside, loose coal chunks and powder are exposed to air, making them highly combustible.

BEGINNING IN 1993, Chinese scientists joined with Dutch and, later, German researchers to map China's coal fires from satellites and aircraft, leading to the discovery of many new fires. "We know there are thousands, but it is too hard to count," says Stefan Voigt, a geographer at the German Aerospace Center near Munich. Extinguishing the fires would require heavy equipment to dig them out and smother them with soil—but China is still largely dependent on picks and shovels. "The Chinese recognize the problem," says Voigt, "but sometimes they'll say: 'We don't need more science. We need more *bulldozers*.'"

China has the most coal fires, but India, where large-scale mining began more than a century ago, accounts for the world's greatest concentration of them. Rising surface temperatures, and toxic byproducts in groundwater and soil, have turned the densely populated Raniganj, Singareni and Jharia coal fields into vast wastelands. Subsidence has forced relocations of villages and roads—then re-relocations, as fire fronts advance. Rail lines give way; buildings disappear. In 1995, a Jharia riverbank was undermined by fire and crumbled; water rushed into underground mines, killing 78. Perhaps the most terrifying spectacle is the unquenched fire itself: many blazes smoldered quietly in old underground tunnels until recently, when modern strip pits exposed them to air. The revitalized flames erupted, engulfing the region in a haze of soot, carbon monoxide and compounds of sulfur and nitrogen. Burning coal also releases arsenic, fluorine and selenium. (Studies in China have suggested that the millions of people who use coal for cooking are being slowly poisoned by such elements.) Even so, workers continue to labor in this highly toxic environment.

And despite a 1990s World Bank study that outlined measures to combat the fires, little has been done to address the problem in either China or India. Prakash and other experts blame bureaucracy, corruption and the sheer overwhelming scale of the problem. "It's just crazy," she says.

Mining is not the only human intensifier of the fires. In

Indonesia, huge tracts of land once covered by rain forest—and underlain by near-surface coal—is fast being logged, then cleared for agriculture. The preferred method: fire. The practice has ignited perhaps 3,000 coal fires since 1982, destroying houses, schools and mosques. Heavy smoke carpets much of Southeast Asia, blocking out sunlight and causing crop failures as well as reducing visibility and, in at least one case, triggering an oil-tanker collision. The smoke is also implicated in an epidemic of asthma. On a smaller scale, a related phenomenon has occurred in the United States; near Glenwood Springs, Colorado, for example, an old coal mine has burned for the past 100 years. In the summer of 2002, the blaze ignited a forest fire that consumed 12,000 acres and 43 buildings. Putting it out cost $6.5 million. And the mine still burns.

Generations of engineers and geologists have puzzled over how to fight these behemoths. "We've learned the hard way—total excavation is usually the only thing," says Alfred Whitehouse, a geologist with the U.S. Office of Surface Mining (OSM). Last year, when range fires near Gillette, Wyoming, set off 60 blazes in coal outcrops, the federal Bureau of Land Management sent a helicopter to map hot spots, then used heavy equipment to dig out the burning fires. It worked. "Those fires are nasty little rascals. You can't let 'em go," says Bud Peyrot, a rancher who has bulldozed a number of hot spots on his place.

But extinguishing relatively small underground fires with bulldozers and backhoes is one thing. Dealing with firebreathing monsters the size of the one in Centralia poses an altogether different magnitude of challenge. Eastern Pennsylvania sits on the world's greatest deposits of anthracite—shiny, hard, clean-burning, high-BTU coal in deep beds, squeezed and twisted by the formation of ridges like the one that rises behind John Lokitis' house. In the 19th and early 20th centuries, miners reached the anthracite deposits through mazes of tunnels, shafts and gangways. If a fire got started in them, miners were usually able to extinguish it before it spread. Then oil and gas replaced anthracite as premier home heating fuels. By the 1950s, most Pennsylvania anthracite mines had been abandoned. Entrances caved in; tunnels began to fill with rubble. Later, strip miners with modern equipment came at the coal from the surface, but they could never reach it all. The result was a landscape of stony debris on top of leftover underground coal laced by interconnected airways—a perfect setting for a coal fire.

THE CENTRALIA FIRE probably got going in May 1962, when local sanitation workers began burning trash at a site over an old mine entrance just outside town, igniting the underlying coal. Over some 20 years, firefighters tried eight times to put it out. First they dug trenches, but the fire outpaced them. Then they attempted "flushing"—a process that involves augering holes

The town's mayor, Lamar Mervine (at his Centralia home), refused to evacuate. But most residents fled after a 12-year-old boy was nearly swallowed by a sinkhole that opened in 1981.

FLAMING DRAGON

IN CHINA, MORE THAN 50 COAL FIRES FUEL A POLLUTION-MAKING NIGHTMARE

Stretching across a barren area of nearly 15 square miles, Inner Mongolia's Wuda coal field is one of China's largest. Aboveground, orange dump trucks bounce over rutted dirt tracks between open pits, trailed by donkey carts whose drivers shovel up spilled chunks of coal. Faces smeared black look out, minstrel-like, from straw-and-mud huts. The land is bleached of life; even a statue of Chairman Mao looks pallid, flaking in the lashing wind.

Below ground, Wuda burns. "This is China's most dangerous fire zone," says Sun Guiliang, the Wuda coal company official in charge of underground blazes. He kneels beside a crack in the sandy earth. Suddenly, he disappears, shrouded by sulfuric smoke. Sun's detached voice rises to compete with a gust. "Currently," he yells, "this is also China's most destructive coal fire." Which puts Wuda in the running for the unenviable crown of World's Worst Ecological Disaster. Of China's estimated 56 active coal conflagrations, 16 burn below ground here.

"An underground coal fire is like a dragon," says Huang Wenhui, a coal fire expert at the China University of Geosciences. The dragon is slow, advancing perhaps 100 feet per year, but hard to reach, nonetheless: the average burning depth at Wuda is 110 feet, reaching down as far as 250 feet. "We can sense the dragon's tail, that is, the area already burned," Huang continues. "But satellite images show the hottest, densest blaze far below the surface, or the dragon's head. We can predict its path, and prepare to chop off its head."

The motivation to do battle? Cutting the enormous economic and environmental losses the fires pose to the world's largest coal producer. China mines nearly two billion tons of coal annually, or more than a ton per Chinese citizen. "China has one of the richest anthracite reservoirs in the world, stretching up to 125 feet deep across a 3,000-mile-long belt," says Anupma Prakash, a geologist at the University of Alaska at Fairbanks. For all the talk of China's growing thirst for oil, coal fuels 75 percent of energy demand. Underground fires, some four decades old, render one-fifth of Wuda's fields inaccessible. China, the world's second-largest coal exporter, may lose more coal to fire than it sells. Billions of dollars go up in smoke.

Earth's atmosphere pays the cost. "China has the most severe coal fires worldwide—both in number and scale," says Stefan Voigt, co-chair of the Sino-German Coal Fire Initiative, which maps the fires from space. "The problem is scale. China's coal fires burn 20 million to 30 million tons of coal annually, pumping tons of ash into the air. A ton of ash results in a bit more than the equivalent in carbon dioxide, and a third of a ton of methane. Compared with carbon dioxide, methane produces 21 times the amount of greenhouse gas emissions."

In Wuhai, a city of 400,000 near the Wuda coal field, the hazy air holds five times the standard amount of carbon monoxide and double the amount of sulfur compounds, according to the local environmental protection agency. "Sour rain," as China dubs acid rain, pockmarks buildings' concrete facades. A nearly eight-square-mile sinkhole reportedly has begun swallowing the foundations of schools, hospitals and houses.

Wuhai started as a company town, formed in 1951; many of Wuda's current 2,150 employees are children of the city's founders. China's economic boom has not ignited here; a Wuda worker's average annual salary is $1,000. All resources, including water, money and manpower, are at a premium.

While satellite images help locate fires, extinguishing them is another matter. Geologist Paul van Dijk of the International Institute for Geo-information Science and Earth Observation (ITC) in the Netherlands estimates that less than 10 percent of China's fires are being fought. "There is no economic incentive to fight if the fire is not close to infrastructure or where a large number of people are living," he says. "Chinese often say something is not a problem if it is not 'in our eyes,' if we can't see it," laments Huang.

There have been successes; in 2003, a century-old fire was extinguished outside metropolitan Urumqi after a four-year "war of life and death between soldier-workers with the fire demon," according to the Chinese press. Still, among Xinjiang Province's 88 coal production zones, 24 remain in flames.

As Sun stands beside a crack seething with smoke explaining smothering—a strategy to suffocate Wuda coal field fires that requires a long, expensive process of sealing the blaze from oxygen—he hears a noise and walks to the lip of the pit. Two blackened faces stare up at him, the gleaners' hands filled with just-extracted coal. "Get away from here!" Sun shouts. "Can't you see there's a fire?"

—MIKE MEYER

Freelance journalist MIKE MEYER *reports from Beijing.*

MICHAEL MEYER

Many of China's coal fields (Mongolia's Wuda, right) are ablaze. Geologist Stefan Voigt says the country is battling "the most severe coal fires worldwide."

Geologist Steve Jones (near Centralia) believes the coal fire under the town will never be extinguished: "Putting it out," he says, "is the impossible dream."

into or ahead of a fire, and pouring down wet sand, gravel, slurries of cement and fly ash to cut off oxygen. (Flushing nearly always fails because of the difficulty of filling every pore space. In addition, because coal fires can exceed 1,000 degrees F, most fill material burns away, leaving more gaps. For both of these reasons, the flushing attempt did not succeed.) Next, state and federal geologists drilled hundreds of exploratory boreholes to define the fire, then dug a huge trench across its supposed path. But the fire had already spread beyond the trench. Some critics believe the digging helped ventilate the fire.

Flooding the area with water was rejected: it is nearly impossible to inundate a large underground area, especially one as complex and well drained as Centralia. In any case, water would have had to be pumped in for years to dissipate the fire's heat. A final solution, to dig a pit three-quarters of a mile long and deep as a 45-story building, would have cost $660 million, more than the value of property in town. It, too, was rejected.

WITHIN A FEW MONTHS, the Centralia fire, which began on the town's outskirts, had spread to its southern edge. At first, this development seemed more curious than calamitous. Kathy Gadinski, then 25, recalls harvesting tomatoes at Christmas from her naturally heated garden. Some folks no longer had to shovel snow. Then things took an ominous turn: residents began passing out in their houses—from carbon monoxide leaking in through their basements. Next, the underground gas tanks at Coddington's Esso gas station, near St. Ignatius Church, started heating up. Route 61, the main road into town, dropped eight feet, and steam spurted out of cracks in the pavement. Then, in 1981, 12-year-old Todd Domboski was crossing through a resident's backyard when a hole opened: he slid out of sight into a dense cloud of gases. The boy saved himself by clinging to a tree root until a cousin pulled him out. After that, just about everyone in Centralia accepted the most radical solution of all: let the mine burn. Most residents took the federal buyout and moved to neighboring towns; more than 600 buildings were demolished. "Putting it out is the impossible dream," says Jones.

In 1992, the town's remaining buildings were condemned; the state took title to Centralia. Lokitis and other die-hards became squatters, but authorities have not evicted anyone. Most of those who have chosen to remain are elderly, and "that would be very bad publicity," says Lamar Mervine, Centralia's flinty, 89-year-old mayor. "They don't want another Waco here." (That, he adds, was a joke.) It's just that he and his wife, Lanna, also 89, like Centralia, even without many neighbors. With much of the demolition zone grassy and still visibly unaffected, they doubt the fire

will reach their 15-foot-wide house, now splendidly isolated at 411 South Troutwine Street.

But Jones says everyone should have moved out years ago. Those who stay, he warns, could die any time from poison gases, whether there's a fire under their property or not. On a recent tour of Centralia, Jones told me that the fire has spread to some 400 acres, growing like an amoeba, about 75 feet a year, along four separate arms. The blaze is most evident along the St. Ignatius Cemetery. The church was pulled down in 1997, but former residents still inter loved ones in the 138-year-old graveyard. (The local joke is that you can get buried and cremated at the same time, no extra charge.) "Actually," says Jones, "I don't think the cemetery itself is on fire. Except maybe that one little corner there."

He points to empty plots where the grass is brown. Above steaming sinkholes lie heaps of hot, recently extruded clinker. Jones' colleague, geologist Timothy Altares, sloshes water onto it: the liquid vaporizes. Then Jones spots a lone metal post—the remnant of a DANGER sign he once posted there. "People keep stealing souvenirs," he growls. Tourists, he says, print directions from Internet sites and wander around snapping photographs. "This is a bad place. One day someone's going to disappear down a sinkhole."

Jones cannot say exactly where the fire is now—its perimeter is beyond the boreholes dug to define it. He believes it has crossed Big Mine Run Road, a short drive outside town, and is heading east. (A roadside sandstone cliff glowed cherry red for a while but now merely wisps steam.) Route 61, on the southwest limb of the fire, remains buckled and steaming; the state has created a detour through neighboring Byrnesville, also virtually abandoned, where just about the only landmark left is a shrine to the Virgin Mary, still maintained by the Reilley family, who no longer live here.

Some residents of nearby towns, such as Mount Carmel (pop. 6,389), fear the fire will reach them, but experts believe it will run out of fuel or hit groundwater before it does. A few miles southwest of Centralia, two separate fires burn deep under mine waste near the village of Locust Gap. So far, the blazes seem confined to about a dozen acres, and it is hard to find surface evidence of them. Gary Greenfield, a geologist who works with Jones, says he doesn't think either of them will reach any houses, but he admits that predicting underground fire paths is like predicting the weather. "I don't think Locust Gap will become another Centralia," he says. "At least not right away." To the east, a fire has burned for at least 25 years near Shenandoah, opening fissures and emitting fumes, but so far causing no damage in the town itself.

Not all of the fires are left to burn; when a blaze threatens buildings or roads, OSM tries to contain it. And often when a new fire is discovered, firefighters may succeed in putting it out. Driving north on Interstate 81 from Wilkes-Barre in his pickup truck, OSM mining engineer David Philbin pointed out grassy spots where the agency replanted vegetation after a fire had been successfully extinguished. On the outskirts of Carbondale, he showed me his greatest triumph: the former Powderly Mine, where a fire of unknown origin broke out in 1995. The agency spent $5.5 million and seven years blasting and moving rock to carve a C-shaped trench 2,150 feet long, 70 feet wide and 150 feet deep. Philbin thinks the fire may burn another 20 years behind the trench but should eventually go out. "My finest moment," he grins. "I'm the architect of this hole."

Digging it was dangerous. Frontloader drivers carried emergency oxygen masks as they ripped smoking coal from the fire edge. The vertical walls of the trench could drop ten-ton boulders. Even now, as heat bakes and cracks the "hot" side of the trench, giant shards regularly split off. Philbin led the way down through a gap in the fence on the hot side, past steaming fissures and hot rock faces. At the base of the trench wall—where three of Philbin's colleagues refused to accompany us—lay hundreds of tons of fresh rockfall. "Well, to outwit a fire, someone's gotta stick his nose in," he said, clambering over debris. In the trench walls were intact coal seams and old tunnel timbers that had not burned. "I like this," Philbin said. "There's adventure here. Some Sherlock Holmes. We think it's contained. But of course a lot of people have been fooled by these things. Personally, I'd like to dig the whole thing out."

Philbin will likely never get the chance. Funds are limited, and to a certain degree, coal field residents who are in no immediate danger accept fires as part of the backdrop, like subway noise in New York City or drizzle in Seattle. On the slope behind Philbin's Wilkes-Barre office, another fire, the forgotten cousin of Centralia, has been smoldering in Laurel Run since 1915. Every attempt to put it out has failed. When gases erupted under one neighborhood in the 1960s, nearly 200 buildings had to be demolished, including 178 houses. Today that section of Laurel Run is a wasteland, frequented by illegal garbage dumpers and teens on all-terrain vehicles. But many people still live in adjacent neighborhoods. The access road to a nearby mobile-home park occasionally slumps, necessitating repairs. "I know if you're from somewhere else, it seems strange, but to me it's nothing unusual," says resident Gene Driscoll, 49, a construction worker who lives at the park. "I've seen fires all my life. No one really worries about it."

BUT IT'S A DIFFERENT STORY in Centralia, where just about every year the little band of holdouts is reduced by death or departure. Lokitis, a civilian accountant for the state police, has been the only resident on West Park since his neighbors, Bernie and Helen Darrah, died in 1996. The Darrahs' house still stands, but the rest of the street is lined with lots vacant except for grass, a patch of backyard forsythia and the town's small monument to its war veterans. Still, Lokitis points out that the fire has never actually killed anyone. In fact, he says,

Only an eerie grid after most houses were leveled, Centralia's former downtown intersection is marked by a haunting monument: a bench with a now-defunct ZIP code.

people here live to ripe old ages—Pop, for example, died at 84 in 2002. Lokitis says he just ignores the occasional whiff of sulfur that comes his way. The fire has not reached his house, because, he insists, it's protected by groundwater and rock—and Pop assured him it never would. Pop knew the underground around here like the back of his hand, Lokitis adds.

Centralia continues to hold municipal elections—8 of the town's 12 residents are officeholders. A $4,000 state budget covers maintenance costs, including the clearing of snow. Lokitis mows what used to be neighbors' yards "to keep things looking neat." Near an empty intersection of four-way stop signs that once marked the center of town, a gleaming volunteer fire truck stands ready to roll. "Of course, we don't have any fires to put out," says Mayor Mervine. When the U.S. Postal Service finally revoked Centralia's ZIP code three years ago, Lokitis mounted a fruitless campaign to restore it, then stenciled the extinct code, 17927, on green park benches. And when the United States invaded Iraq in 2003, someone tied yellow ribbons on four nearby telephone poles. At Christmas, a few former residents faithfully return to set up a manger scene. Lokitis claims many will turn up in 2016 to open a time capsule buried in 1966 next to the veterans' memorial.

In addition to the tourists, scientists come to Centralia as well, to study volcano-like minerals forming around cracks in the soil and to probe for unusual heat-loving bacteria. TV and newspaper reporters show up, seeking offbeat features. Recently, a delegation of Russian scholars studying industrial disasters came calling. "Sometimes you feel like an exhibit," says Lokitis.

Mayor Mervine was pictured in *Esquire* not long ago, over a caption reading: "I ain't leaving." Wild turkeys, hummingbirds, deer and rabbits have replaced crammed-in row houses. Recently, a black bear ambled down South Troutwine. Since no one owns property, no one pays property taxes, and the parking situation could hardly be improved. City councilman John Comarnisky is talking half-seriously about buying a few bison, putting them out to pasture, and promoting Centralia as the Yellowstone of the East. To hear some people talk, the place is coming back.

In his heart, Lokitis may know better. When Pop was buried next to Lokitis' grandmother at St. Ignatius last year, the grandson selected a headstone of polished, jet-black granite—a stone resembling top-grade anthracite. On the monument, a mason etched portraits of the couple, as well as images of St. Ignatius Church, the entry to the R&L Coal tunnel, and the house where Lokitis lives. "I wanted a permanent memorial of this place," he said. Steam rises about 100 feet from his home and seeps even closer from the grave just up the hill. But for now, the grass is still green.

"TAXI RIDE" PHOTOGRAPHER: **GOUR, 16**

Living at home with his mother, Gour hopes to go to college someday. "I want to show in pictures how people live in this city," Gour says in the book *Born into Brothels*, a companion to the film.

ALL PHOTOGRAPHS: KIDS WITH CAMERAS

British documentary filmmaker Zana Briski and collaborator Ross Kauffman won an Academy Award this past February (right, with actor Leonardo DiCaprio) for *Born into Brothels*, their chronicle of Briski's work with kids in a Calcutta red-light district. Among other things, she gave the children cameras and taught them how to capture their surroundings.

BOTTOM: TIMOTHY A. CLARY / AFP / GETTY IMAGES

AN OSCAR-WINNING DOCUMENTARY SHOWCASES THE RESILIENCE—AND VISION—OF TALENTED INDIAN CHILDREN BORN IN THE CITY'S BROTHELS

BY ANDREW CURRY

YOUNG EYES ON CALCUTTA

ON A TRIP TO CALCUTTA in 1997, Zana Briski visited the Sonagachi neighborhood, the oldest and largest red-light district in Calcutta. She was intrigued by its warren of brothels and other illegal businesses. Over the next two years the British-born photojournalist kept going back to get closer to the prostitutes and brothel owners whose lives she hoped to document. "Photography there is completely taboo," says Briski, 38, who now lives in New York City. "People there don't usually see Westerners, let alone people with cameras." She spent countless hours with the women, ultimately even convincing one brothel owner to rent her a room. "The women trusted me," she says.

As Briski worked, she was surprised that children—most of them sons and daughters of prostitutes—would surround her, fascinated by her camera. So she started teaching them to take pictures, setting up weekly classes and giving them cheap, point-and-shoot cameras with which to experiment. Their snapshots—arresting portraits of their families, each other and the surrounding streets—capture a chaotic world as few outsiders could.

Briski pressed on, securing grants to fund her efforts, soon dubbed Kids with Cameras, and arranging to sell the kids' photographs in Calcutta and New York City galleries. The pictures attracted attention. "These

"MAN ON STREET" PHOTOGRAPHER: **PUJA, 13**

Puja left boarding school to move back in with her mother. She takes computer and English classes; filmmaker Ross Kauffman says Puja text-messages him regularly from her cellphone.

"BABAI" PHOTOGRAPHER: **KOCHI, 13**

Kochi lives in a Calcutta boarding school, where she has learned English. "I feel shy taking pictures outside," she says. "People taunt us. They say, 'Where did they bring those cameras from?'"

"GIRL ON A ROOF" PHOTOGRAPHER: **SUCHITRA, 16**

An aunt took Suchitra to work as a housekeeper to help her family make ends meet. In January, Kids with Cameras covered the income she'd made cleaning and paid for her to go back to school.

children have what adults most often don't: total openness," says Robert Pledge, co-founder of the Contact Press Images agency. Briski persuaded Pledge to meet the children, and he was soon convinced that the pictures had genuine merit. "Most photography is observation, from the outside," he says. "You're very rarely inside, looking from the inside out."

But teaching photography wasn't enough. Briski plunged full time into trying to help several of the kids get into private schools—all the while videotaping her efforts and their struggles. For two years beginning in 2002, Briski and New York-based filmmaker Ross Kauffman shot 170 hours of video of the children. Just walking through Sonagachi with a camera invited trouble, Kauffman says. "It was always a very tenuous situation. We had to be careful of when and how and who we were shooting. A fight could explode at any time because of the cameras, because of anything."

This past February, the resulting documentary, *Born into Brothels*, added an Academy Award for Best documentary feature to its more than 20 other awards, including the Audience Award at the Sundance Film Festival. *New York Times* critic A. O. Scott called the 85-minute film "moving, charming and sad, a tribute . . . to the irrepressible creative spirits of the children themselves."

Briski and Kauffman, to preserve the subjects' anonymity, have chosen not to screen the film in India, though aid workers in Calcutta say that the children's identities are no secret; their names have been widely reported in the Indian press and the kids have appeared on Indian television. Critics there complain that Briski didn't sufficiently credit aid workers who helped her, and that her approach—taking the children out of their brothel homes and placing them in boarding schools—was presumptuous.

To be sure, her movie documents that some of the kids she sponsored dropped out of school. But she remains committed to her original vision of educating the children, and plans to go back to Calcutta this spring, where she hopes to open a small school for children like those in the film, with a curriculum that will focus on arts and leadership. She also wants to expand Kids with Cameras to Haiti and Egypt.

For children in Sonagachi and other Indian brothels, the cycle of poverty and prostitution is difficult to break. According to India's National Human Rights Commission, hundreds of thousands of Indian women work as prostitutes; some Indian aid organizations place the estimate as high as 15.5 million. Almost half of them began working as children. "The numbers have gone up and the ages have gone down,"

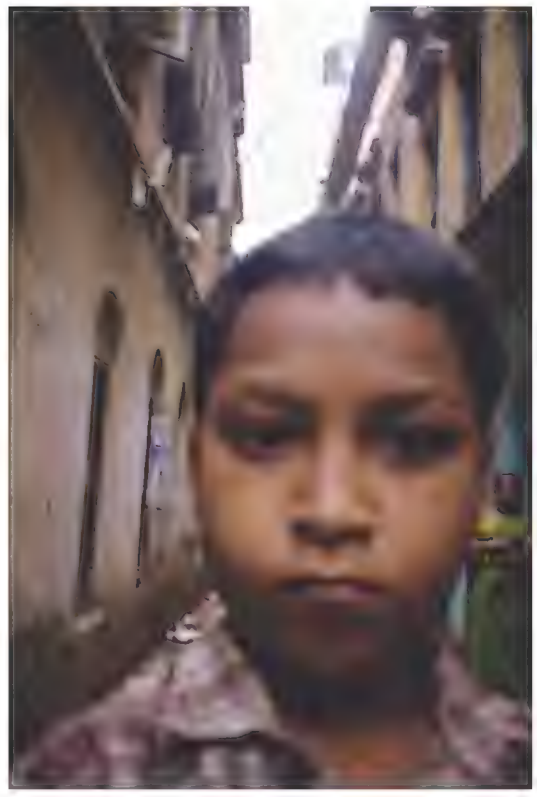
ANDREW CURRY is general editor of the magazine.

"BUCKETS" PHOTOGRAPHER: **AVIJIT, 15**

Avijit's photography earned him an invitation to the World Press Photo convention in Amsterdam. Today, Avijit e-mails Briski and Kauffman regularly from the boys' boarding school he attends in Calcutta.

"SELF-PORTRAIT" AVIJIT, 15

Avijit, whose mother was killed in a fire, dreams of attending art school in New York City some day.



Photojournalist Zana Briski first traveled to India to document women's issues. Her involvement with the women and children of a Calcutta brothel led to photo classes for the kids, her way of giving something back. The goal, says collaborator Ross Kauffman, "was to empower and give them a sense of self-esteem through photography." The student photographers are (front row, from left) Puja, Kochi, Tapasi, Manik, Shanti (back row), Suchitra, Avijit and Gour. The profits from the photos are in a fund for their education.

BOTTOM: ZANA BRISKI

"OIL LAMP" PHOTOGRAPHER: **AVIJIT, 15**

Photography opened up a new way of looking at the world for Avijit. "I used to want to be a doctor. Then I wanted to be an artist," he says. "Now I want to be a photographer."

"SHEEP" PHOTOGRAPHER: **SHANTI, 14**

Some of Briski's students have struggled since the project. Shanti dropped out of school twice. "We're worried," Kauffman says.

says Ruchira Gupta, an Emmy-winning documentary filmmaker who in 1997 founded Calcutta-based Apne Aap Women Worldwide to help Indian prostitutes. Gupta says brothel owners and pimps often press young women to have babies, making them more financially dependent on the brothel. "When mothers die of AIDS or other diseases," Gupta adds, "their daughters are immediately brought in."

In *Born into Brothels*, Briski's star student is Avijit, whose self-portraits and street scenes so impressed Pledge that he arranges for the boy to visit the World Press Photo Children's Competition in Amsterdam. But when Avijit's mother is killed by a pimp, the pudgy 12-year-old drifts away, skips photography classes and stops taking pictures.

Briski, in a final effort to rescue the boy, finds Avijit and takes him to get a passport the day before he is to leave for Amsterdam. Avijit makes the journey from Sonagachi to Amsterdam, and to see him discussing photography with children from around the world in the exhibition's crowded halls is to see raw potential released. "Children at that age can so easily go in one or another direction," says Pledge. "That environment isn't specific to India, or to red-light districts. All kids have amazing learning abilities, and they're being robbed constantly in all parts of the world—sometimes not that far away."

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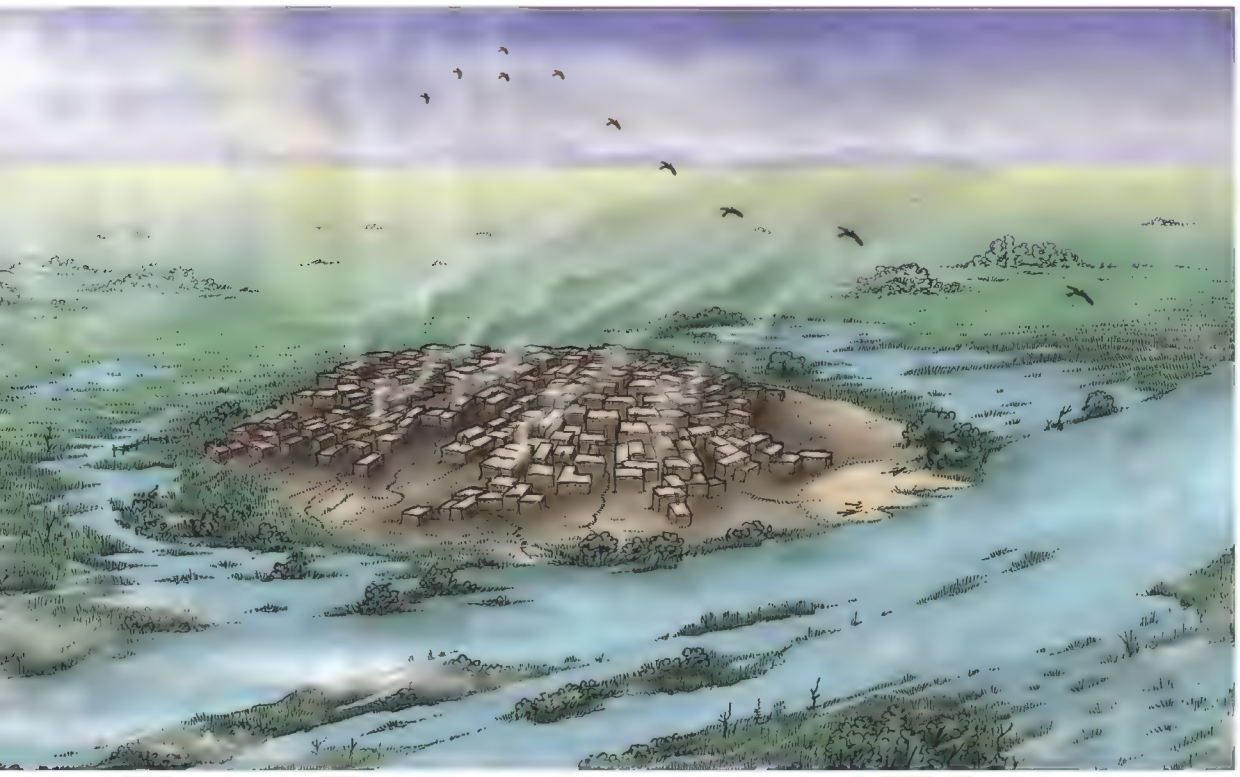
WHY DID HUMANS FIRST TURN FROM NOMADIC WANDERING TO VILLAGES AND TOGETHERNESS? THE ANSWER MAY LIE IN A 9,500-YEAR-OLD SETTLEMENT IN CENTRAL TURKEY

BY MICHAEL BALTER

THE SEEDS OF CIVILIZATION



"BASAK, they need you in Building 42 again."

Basak Boz looked up from the disarticulated human skeleton spread out on the laboratory bench in front of her.

The archaeologist standing in the lab doorway shuffled his dusty boots apologetically. "It looks like something really important this time," he said.

Building 42 is one of more than a dozen mud-brick dwellings under excavation at Catalhoyuk, a 9,500-year-old Neolithic, or New Stone Age, settlement that forms a great mound overlooking fields of wheat and melon in the Konya Plain of south-central Turkey. In the previous two months, archaeologists working on Building 42 had uncovered the remains of several individuals under its white plaster floors, including an adult, a child and two infants. But this find was different. It was the body of a woman who had been laid on her side, her legs drawn to her chest in a fetal position. Her arms, crossed over her chest, seemed to be cradling a large object.

Boz, a physical anthropologist at Hacettepe University in Ankara, Turkey, walked up a hill to Building 42. She took out a set of imple-

Unusual finds (right, a body buried under a plastered floor) fuel new ideas about the impetus for one of the first long-term settlements (left, top, an artist's conception; left, the site today).

JOHN G. SWOGGER; P. 68 BOTTOM AND P. 69 ÇATALHÖYÜK RESEARCH PROJECT

20 cm

ments, including an oven baster for blowing off dust and a small scalpel, and set to work. After about an hour, she noticed a powdery white substance around the object the skeleton cradled.

"Ian!" she said, beaming. "It's a plastered skull!"

Ian Hodder, the Stanford University archaeologist who directs the Catalhoyuk excavations, was making his morning rounds of the 32-acre site. He crouched next to Boz to take a closer look. The skull's face was covered with soft, white plaster, much of it painted ochre, a red pigment. The skull had been given a plaster nose, and its eye sockets had been filled with plaster. Boz could not be sure if the skull was male or female at first, but from the close knitting of the suture in the cranium (which closes as people age), she could tell that it belonged to an older person; later testing showed it was a woman's.

Since researchers first began digging at Catalhoyuk (pronounced "Chah-tahl-hew-yook") in the 1960s, they've found more than 400 skeletons under the houses, which are clustered in a honeycomb-like maze. Burying the dead under houses was common at early agricultural villages in the Near East—at Catalhoyuk, one dwelling alone had 64 skeletons. Plastered skulls were less common and have been found at only one other Neolithic site in Turkey, though some have been found in the Palestinian-controlled city of Jericho and at sites in Syria and Jordan. This was the first one ever found at Catalhoyuk—and the first buried with another human skeleton. The burial hinted at an emotional bond between two people. Was the plastered skull that of a parent of the woman buried there nine millennia ago?

Hodder and his colleagues were also working to decipher paintings and sculptures found at Catalhoyuk. The surfaces of many houses are covered with murals of men hunting wild deer and cattle and of vultures swooping down on headless people. Some plaster walls bear bas-reliefs of leopards and apparently female figures that may represent goddesses. Hodder is convinced that this symbol-rich settlement, one of the largest and best-preserved Neolithic sites ever discovered, holds the key to prehistoric psyches and to one of the most fundamental questions about humanity: why people first settled in permanent communities.

In the millennia before Catalhoyuk's flowering, most of the Near East was occupied by nomads who hunted gazelle, sheep, goats and cattle, and gathered wild grasses, cereals, nuts and fruits. Why, beginning about 14,000 years ago, did they take the first steps toward permanent communities, settling together in stone houses and eventually inventing farming? A few millennia later, as many as 8,000 people gathered in Catalhoyuk, and they stayed put for more than a thousand years, building and rebuilding houses packed so closely together that residents had to enter through the roofs. "The formation of the first communities was a major turning point in

In 1993, dig leader Ian Hodder (above left) resumed work at the site, neglected for decades after Catalhoyuk's discoverer, James Mellaart (right), was barred by the Turkish government following an antiquities scandal. Mellaart has since been exonerated.

ÇATALHÖYÜK RESEARCH PROJECT; JAMES MELLAART; MAP: MIKE REAGAN

"It's a plastered skull!" shouted anthropologist Basak Boz (with the artifact). To researchers, who have documented more than 400 human burials at Catalhoyuk, the find is evidence of a prehistoric artistic and spiritual awakening.

humanity's development, and the people of Catalhoyuk seem to have pushed the idea to an extreme," says Hodder. "But we are still left with the question of why they would bother to come together in such numbers in the first place."

For decades, it seemed that Catalhoyuk's mysteries might never be explored. James Mellaart, a British archaeologist, discovered the site in 1958 and made it famous. But his research was cut short in 1965, after Turkish authorities withdrew his excavation permit after alleging he was involved in the Dorak Affair, a scandal in which important Bronze Age artifacts reportedly went missing. Mellaart was not formally charged, and a committee of distinguished archaeologists later exonerated him of any role in the affair. Still, he was never allowed back at the site, and it sat neglected for nearly 30 years.

Hodder, a tall, bespectacled, 56-year-old Englishman, first heard about Catalhoyuk in 1969 as a student of Mellaart's at London's Institute of Archaeology. In 1993, after some delicate negotiations with Turkish authorities, helped greatly by support from leading Turkish archaeologists, he was given permission to reopen the site. Nearly 120 archaeologists, anthropologists, paleoecologists, botanists, zoologists, geologists and chemists have gathered at the mound near Konya summer after summer, sieving through nearly every cubic inch of Catalhoyuk's ancient soil for clues about how these Neolithic people lived and what they believed. The researchers even brought in a psychoanalyst to provide insights into the prehistoric mind. Catalhoyuk, says Colin Renfrew, emeritus professor of archaeology at Cambridge University in Britain, is "one of the most ambitious excavation projects currently in progress." Bruce Trigger of Montreal's McGill University, a noted historian of archaeology, says Hodder's work at the site "is providing a new model of how archaeological research can and should be carried out." Still, Hodder's unorthodox approach—combining scientific rigor and imaginative speculation to get at the psychology of Catalhoyuk's prehistoric inhabitants—has generated controversy.

MICHAEL BALTER is the author of The Goddess and the Bull, Çatalhöyük: An Archaeological Journey to the Dawn of Civilization, *published in 2005 by Free Press.*

ÇATALHÖYÜK RESEARCH PROJECT

A wild animal (above) and a three-inch female figure found last year (below) could be toys—or, archaeologists say, religious art. Hundreds of human figurines have been uncovered at Catalhoyuk since 1993, but their role and importance remain a mystery. Researchers hope advanced techniques like fingerprint analysis will yield more clues.

Archaeologists have long debated what caused the Neolithic Revolution, when prehistoric human beings gave up the nomadic life, founded villages and began to farm the land. Academics once emphasized climatic and environmental changes that took place about 11,500 years ago, when the last ice age came to an end and agriculture became possible, maybe even necessary, for survival. Hodder, on the other hand, emphasizes the role played by changes in human psychology and cognition.

Mellaart, now retired and living in London, believed that religion was central to the lives of Catalhoyuk's people. He concluded that they had worshiped a mother goddess, as represented by a plethora of female figurines, made of fired clay or stone, that both he and Hodder's group have unearthed at the site over the years. Hodder questions whether the figurines represent religious deities, but he says they're significant nonetheless. Before humans could domesticate the wild plants and animals around them, he says, they had to tame their own wild nature—a psychological process expressed in their art. In fact, Hodder believes that Catalhoyuk's early settlers valued spirituality and artistic expression so highly that they located their village in the best place to pursue them.

Not all archaeologists agree with Hodder's conclusions. But there's no doubt the Neolithic Revolution changed humanity forever. The roots of civilization were planted along with the first crops of wheat and barley, and it's not a stretch to say that the mightiest of today's skyscrapers can trace their heritage to the Neolithic architects who built the first stone dwellings. Nearly everything that came afterward, including organized religion, writing, cities, social inequality, population explosions, traffic jams, mobile phones and the Internet, has roots in the moment people decided to live together in communities. And once they did so, the Catalhoyuk work shows, there was no turning back.

THE PHRASE "Neolithic Revolution" was coined in the 1920s by the Australian archaeologist V. Gordon Childe, one of the 20th century's leading prehistorians. For Childe, the key innovation in the revolution was agriculture, which made human beings the masters of their food supply. Childe himself had a fairly straightforward idea about why agriculture was invented, arguing that with the end of the last ice age about 11,500 years ago, the earth became both warmer and drier, forcing people and animals to gather near rivers, oases and other water sources. From such clusters came communities. But Childe's theory fell out of favor after geologists and botanists discovered that the climate after the ice age was actually wetter, not drier.

Another explanation for the Neolithic Revolution, and one of the most influential, was the "marginality," or "edge," hypothesis, proposed in the 1960s by the pioneering archaeologist Lewis Binford, then at the University of New Mexico. Binford argued that early human beings would have lived where the hunting and gathering were best. As populations increased, so did competition for resources, among other

ÇATALHÖYÜK RESEARCH PROJECT (2)

The bull figured prominently in artworks at Catalhoyuk (a mural), and bull skulls have even been found molded in walls and floors. Researchers speculate the animal symbolized the power of nature—and of people to overcome it.

stresses, leading some people to move to the margins, where they resorted to domesticating plants and animals. But this idea does not square with recent archaeological evidence that plant and animal domestication actually began in the optimal hunting and gathering zones of the Near East, rather than in the margins.

Such traditional explanations for the Neolithic Revolution fall short, according to Hodder, precisely because they focus too much on the beginnings of agriculture at the expense of the rise of permanent communities and sedentary life. Though prehistorians once assumed that farming and settling down went hand in hand, even that assumption is being challenged, if not overturned. It's now clear that the first year-round, permanent human settlements predated agriculture by at least 3,000 years.

In the late 1980s, a drought caused a drastic drop in the Sea of Galilee in Israel, revealing the remains of a previously unknown archaeological site, later named Ohalo II. There, Israeli archaeologists found the burned remains of three huts made from brush plants, as well as a human burial and several hearths. Radiocarbon dating and other findings suggested that the site, a small, year-round camp for hunter-gatherers, was about 23,000 years old.

By about 14,000 years ago, the first settlements built with stone began to appear, in modern-day Israel and Jordan. The inhabitants, sedentary hunter-gatherers called Natufians, buried their dead in or under their houses, just as Neolithic peoples did after them. The first documented agriculture began some 11,500 years ago in what Harvard archaeologist Ofer Bar-Yosef calls the Levantine Corridor, between Jericho in the Jordan Valley and Mureybet in the Euphrates Valley.

In short, the evidence indicates that human communities came first, before agriculture. Could it be, as Hodder tends to believe, that the establishment of human communities was the real turning point, and agriculture just the icing on the cake?

Hodder has been influenced by the theories of the French prehistory expert Jacques Cauvin, one of the first to champion the notion that the Neolithic Revolution was sparked by changes in psychology. In the 1970s Cauvin and his co-workers were digging at Mureybet, in northern Syria, where they found evidence for an even earlier Natufian occupation underneath the Neolithic layers. The sediments corresponding to the transition from the Natufian to the Neolithic contained wild bull horns. And as the Neolithic progressed, a number of female figurines turned up. Cauvin concluded that such findings could mean only one thing: the Neolithic Revolution had been preceded by a "revolution of symbols," which led to new beliefs about the world.

After surveying several Neolithic sites in Europe, Hodder concluded that a symbolic revolution had taken place in Europe as well. Because the European sites were full of representations of death and wild animals, he believes that prehistoric humans had attempted to overcome their fear of wild nature, and of their own mortality, by bringing the symbols of death and the wild into their dwellings, thus render-

JAMES MELLAART

ing the threats psychologically harmless. Only then could they start domesticating the world outside. It was Hodder's search for the origins of that transformation that eventually took him to Catalhoyuk.

BY THE TIME Catalhoyuk was first settled—about 9,500 years ago, according to a recent round of radiocarbon dating at the site—the Neolithic epoch was well under way. The residents of this huge village cultivated wheat and barley, as well as lentils, peas, bitter vetch and other legumes. They herded sheep and goats. Paleoecologists working with Hodder say the village was located in the middle of marshlands that may have been flooded two or three months out of the year. But ongoing research suggests the village wasn't anywhere near its crops.

So where did they grow food? Tentative evidence has come from Arlene Rosen, a geoarchaeologist at the Institute of Archaeology in London and an expert in the analysis of phytoliths, tiny fossils formed when silica from water in the the soil is deposited in plant cells. Researchers think phytoliths may help reveal some of the conditions in which plants were grown. Rosen determined that the wheat and barley found at marshy Catalhoyuk were likely grown on dry land. And yet, as other researchers had shown, the closest arable dry land was at least seven miles away.

Why would a farming community of 8,000 people establish a settlement so far from its fields? For Hodder, there is only one explanation. The settlement site, once right in the middle of marshlands, is rich in the dense clays that villagers used to make plaster. They painted artworks on plaster, and they fashioned sculptures and figurines out of plaster. "They were plaster freaks," Hodder says.

If the people of Catalhoyuk had located their village in the wooded foothills, they would have had easy access to their crops and to the oak and juniper trees they used in their mud-brick houses. But they would have had a difficult, perhaps impossible, time transporting the clay from the marshes over a distance of seven miles: the material must be kept wet, and the villagers' small reed-and-grass baskets were hardly suitable for carrying the large quantities that they clearly used to plaster and replaster the walls and floors of their houses. It would have been easier for them to carry their crops to the village (where, as it happened, the foodstuffs were stored in plaster bins). In addition, the Carsamba River, which in prehistoric times flowed right past Catalhoyuk, would have enabled villagers to float juniper and oak logs from the nearby forests to their building sites.

Some experts disagree with Hodder's interpretations, including Harvard's Bar-Yosef, who believes sedentariness became more attractive for hunter-gatherers when environmental and demographic pressures pushed them to keep their resources together. Boston University archaeologist Curtis Runnels, who has conducted extensive studies of prehistoric settlements in Greece, says that nearly all early Neolithic sites there were located near springs or rivers, but those settlers seldom decorated their walls with plaster. Runnels says there may well be other reasons that Catalhoyuk occupants settled in the marsh, even if it is not yet clear what they were. "Economic factors always seem a little inadequate to explain the details of Neolithic life, particularly at a site as interesting as Catalhoyuk," Runnels says. "But my view is that Neolithic peoples first had to secure a dependable supply of food, then they could concentrate on ritual practices."

Catalhoyuk art (a conservator, above) speaks to an early emphasis on shared rituals. "Communal ceremonies come first," Hodder says. "That pulls people together."

But Hodder maintains that the people of Catalhoyuk gave a higher priority to culture and religion than to subsistence and, like people today, came together for shared community values like religion. Hodder sees support for that idea in other recent Neolithic digs in the Near East. At 11,000-year-old Gobekli Tepe in southeastern Turkey, a German team has uncovered stone pillars decorated with images of bears, lions and other wild animals. "These appear to be some sort of monuments, and they were built 2,000 years before Catalhoyuk," Hodder says. "And yet there are no domestic houses in the early levels of settlement at Gobekli. The monuments appear to belong to some sort of ritual ceremonial center. It is as if communal ceremonies come first, and that pulls people together. Only later do you see permanent houses being built."

At Catalhoyuk, the plaster-covered skull found last year testifies to the material's significance for the people of this prehistoric village. Yet the find leaves Hodder and his coworkers with an enigmatic portrait of early human togetherness: a woman lying in her grave, embracing the painted skull of someone presumably very important to her for 9,000 years. Whatever brought our ancestors together, it was enough to keep them together—in death as well as in life.

ÇATALHÖYÜK RESEARCH PROJECT

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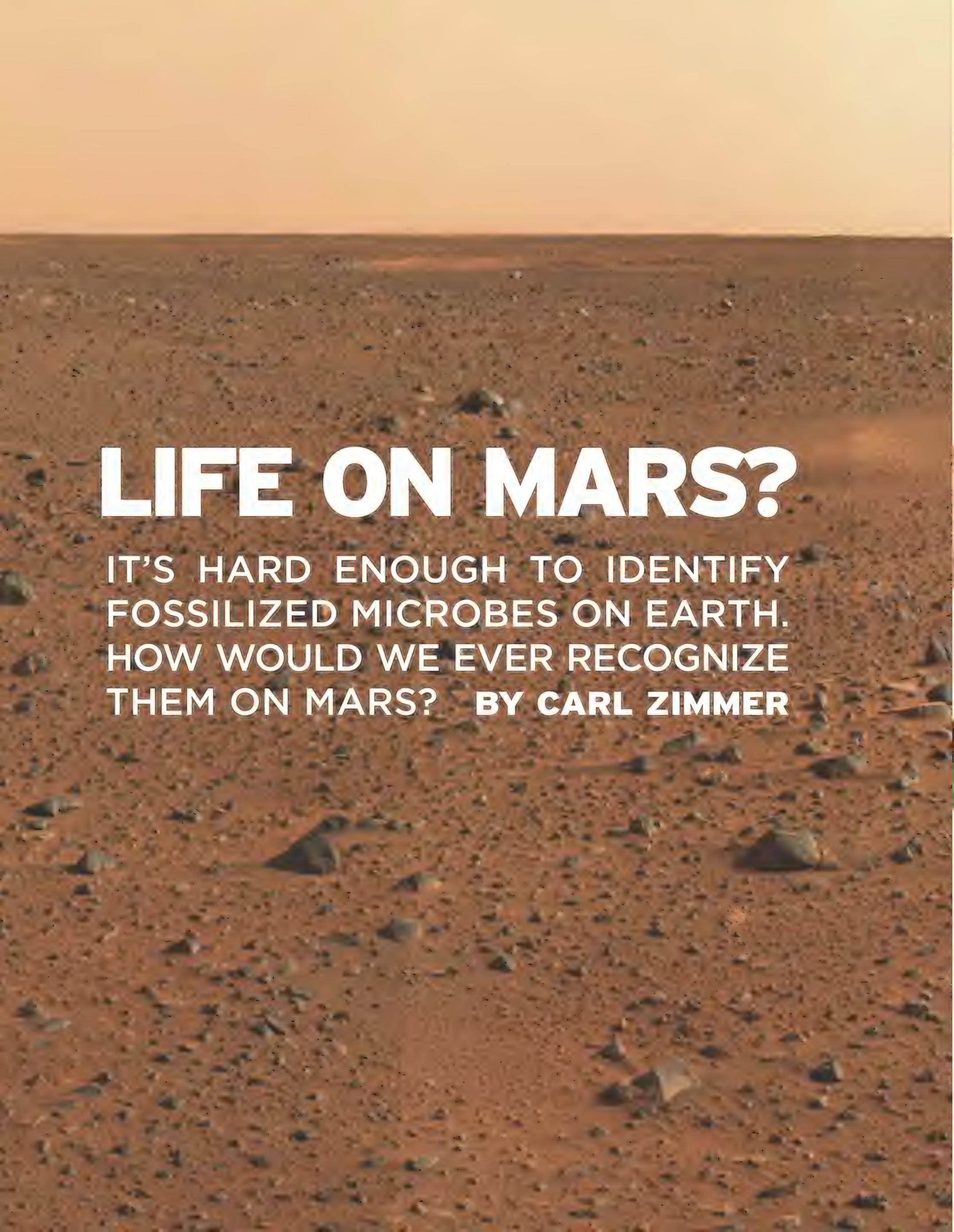


LIFE ON MARS?

IT'S HARD ENOUGH TO IDENTIFY FOSSILIZED MICROBES ON EARTH. HOW WOULD WE EVER RECOGNIZE THEM ON MARS?

BY CARL ZIMMER

ON AUGUST 7, 1996, reporters, photographers and television camera operators surged into NASA headquarters in Washington, D.C. The crowd focused not on the row of seated scientists in NASA's auditorium but on a small, clear plastic box on the table in front of them. Inside the box was a velvet pillow, and nestled on it like a crown jewel was a rock—from Mars. The scientists announced that they'd found signs of life inside the meteorite. NASA administrator Daniel Goldin gleefully said it was an "unbelievable" day. He was more accurate than he knew.

The rock, the researchers explained, had formed 4.5 billion years ago on Mars, where it remained until 16 million years ago, when it was launched into space, probably by the impact of an asteroid. The rock wandered the inner solar system until 13,000 years ago, when it fell to Antarctica. It sat on the ice near Allan Hills until 1984, when snowmobiling geologists scooped it up.

Scientists headed by David McKay of the Johnson Space Center in Houston found that the rock, called ALH84001, had a peculiar chemical makeup. It contained a combination of minerals and carbon compounds that on Earth are created by microbes. It also had crystals of magnetic iron oxide, called

A Martian meteorite fueled speculation and debate in 1996 (above left, at NASA headquarters) when scientists reported that it held signs of past life (right, bacteria-like blobs). The search now moves to Mars itself.

DOUG MILLS / AP / WIDE WORLD PHOTOS; NASA / PHOTO RESEARCHERS; P. 76 NASA / JPL

magnetite, which some bacteria produce. Moreover, McKay presented to the crowd an electron microscope view of the rock showing chains of globules that bore a striking resemblance to chains that some bacteria form on Earth. "We believe that these are indeed microfossils from Mars," McKay said, adding that the evidence wasn't "absolute proof" of past Martian life but rather "pointers in that direction."

Among the last to speak that day was J. William Schopf, a University of California at Los Angeles paleobiologist, who specializes in early Earth fossils. "I'll show you the oldest evidence of life on this planet," Schopf said to the audience, and displayed a slide of a 3.465 billion-year-old fossilized chain of microscopic globules that he had found in Australia. "These are demonstrably fossils," Schopf said, implying that NASA's Martian pictures were not. He closed by quoting the astronomer Carl Sagan: "Extraordinary claims require extraordinary evidence."

Despite Schopf's note of skepticism, the NASA announcement was trumpeted worldwide. "Mars lived, rock shows Meteorite holds evidence of life on another world," said the *New York Times*. "Fossil from the red planet may prove that we are not alone," declared *The Independent of London*.

Over the past nine years, scientists have taken Sagan's words very much to heart. They've scrutinized

the Martian meteorite (which is now on view at the Smithsonian's National Museum of Natural History), and today few believe that it harbored Martian microbes.

The controversy has prompted scientists to ask how they can know whether some blob, crystal or chemical oddity is a sign of life—even on Earth. A debate has flared up over some of the oldest evidence for life on Earth, including the fossils that Schopf proudly displayed in 1996. Major questions are at stake in this debate, including how life first evolved on Earth. Some scientists propose that for the first few hundred million years that life existed, it bore little resemblance to life as we know it today.

NASA researchers are taking lessons from the debate about life on Earth to Mars. If all goes as planned, a new generation of rovers will arrive on Mars within the next decade. These missions will incorporate cutting-edge biotechnology designed to detect individual molecules made by Martian organisms, either living or long dead.

The search for life on Mars has become more urgent thanks in part to probes by the two rovers now roaming Mars' surface and another spaceship that is orbiting the planet. In recent months, they've made a series of astonishing discoveries that, once again, tempt scientists to believe that Mars harbors life—or did so in the past. At a February conference in the Netherlands, an audience of Mars experts was surveyed about Martian life. Some 75 percent of the scientists said they thought life once existed there, and of them, 25 percent think that Mars harbors life today.

CARL ZIMMER is the author of Soul Made Flesh, *which will appear in paperback in June. He lives in Guilford, Connecticut.*

THE SEARCH FOR THE FOSSIL REMAINS of primitive single-celled organisms like bacteria took off in 1953, when Stanley Tyler, an economic geologist at the University of Wisconsin, puzzled over some 2.1 billion-year-old rocks he'd gathered in Ontario, Canada. His glassy black rocks known as cherts were loaded with strange, microscopic filaments and hollow balls. Working with Harvard paleobotonist Elso Barghoorn, Tyler proposed that the shapes were actually fossils, left behind by ancient life-forms such as algae. Before Tyler and Barghoorn's work, few fossils had been found that predated the Cambrian Period, which began about 540 million years ago. Now the two scientists were positing that life was present much earlier in the 4.55 billion-year history of our planet. How much further back it went remained for later scientists to discover.

In the next decades, paleontologists in Africa found 3 billion-year-old fossil traces of microscopic bacteria that had lived in massive marine reefs. Bacteria can also form what are called biofilms, colonies that grow in thin layers over surfaces such as rocks and the ocean floor, and scientists have found solid evidence for biofilms dating back 3.2 billion years.

To J. William Schopf (right, with an Australian Warrawoona specimen), one of the most ancient Earth fossils is a filament (left) that he contends is evidence of microbes that lived 3.465 billion years ago and may have generated much of our atmospheric oxygen.

WILLIAM SCHOPF; REED HUTCHINSON / UCLA

But at the time of the NASA press conference, the oldest fossil claim belonged to UCLA's William Schopf, the man who spoke skeptically about NASA's finds at the same conference. During the 1960s, '70s and '80s, Schopf had become a leading expert on early life-forms, discovering fossils around the world, including 3 billion-year-old fossilized bacteria in South Africa. Then, in 1987, he and some colleagues reported that they had found the 3.465 billion-year-old microscopic fossils at a site called Warrawoona in the Western Australia outback—the ones he would display at the NASA press conference. The bacteria in the fossils were

so sophisticated, Schopf says, that they indicate "life was flourishing at that time, and thus, life originated appreciably earlier than 3.5 billion years ago."

Since then, scientists have developed other methods for detecting signs of early life on Earth. One involves measuring different isotopes, or atomic forms, of carbon; the ratio of the isotopes indicates that the carbon was once part of a living thing. In 1996, a team of researchers reported that they had found life's signature in rocks from Greenland dating back 3.83 billion years.

The signs of life in Australia and Greenland were remarkably old, especially considering that life probably could not have persisted on Earth for the planet's first few hundreds of millions of years. That's because asteroids were bombarding it, boiling the oceans and likely sterilizing the planet's surface before about 3.8 billion years ago. The fossil evidence suggested that life emerged soon after our world

Schopf says some Warrawoona fossil microbes resembled today's cyanobacteria (in stromatolite colonies in Australia).

JOHN READER / PHOTO RESEARCHERS

cooled down. As Schopf wrote in his book *Cradle of Life*, his 1987 discovery "tells us that early evolution proceeded very far very fast."

A quick start to life on Earth could mean that life could also emerge quickly on other worlds—either Earth-like planets circling other stars, or perhaps even other planets or moons in our own solar system. Of these, Mars has long looked the most promising.

The surface of Mars today doesn't seem like the sort of place hospitable to life. It is dry and cold, plunging down as far as -220 degrees Fahrenheit. Its thin atmosphere cannot block ultraviolet radiation from space, which would devastate any known living thing on the surface of the planet. But Mars, which is as old as Earth, might have been more hospitable in the past. The gullies and dry lake beds that mark the planet indicate that water once flowed there. There's also reason to believe, astronomers say, that Mars' early atmosphere was rich enough in heat-trapping carbon dioxide to create a greenhouse effect, warming the surface. In other words, early Mars was a lot like early Earth. If Mars had been warm and wet for millions or even billions of years, life might have had enough time to emerge. When conditions on the surface of Mars turned nasty, life may have become extinct there. But fossils may have been left behind. It's even possible that life could have survived on Mars below the surface, judging from some microbes on Earth that thrive miles underground.

WHEN NASA'S MCKAY presented his pictures of Martian fossils to the press that day in 1996, one of the millions of people who saw them on television was a young British environmental microbiologist named Andrew Steele. He had just earned a PhD at the University of Portsmouth, where he was studying bacterial biofilms that can absorb radioactivity from contaminated steel in nuclear facilities. An expert at microscopic images of microbes, Steele got McKay's tele-

A QUICK START TO LIFE ON EARTH COULD MEAN THAT LIFE COULD EMERGE QUICKLY ON PLANETS CIRCLING OTHER STARS, OR PERHAPS EVEN PLANETS OR MOONS IN OUR SOLAR SYSTEM.

phone number from directory assistance and called him. "I can get you a better picture than that," he said, and convinced McKay to send him pieces of the meteorite. Steele's analyses were so good that soon he was working for NASA.

Ironically, though, his work undercut NASA's evidence: Steele discovered that Earthly bacteria had contaminated the Mars meteorite. Biofilms had formed and spread through cracks into its interior. Steele's results didn't disprove the Martian fossils outright—it's possible that the meteorite contains both Martian fossils and Antarctic contaminants—but, he says, "The problem is, how do you tell the difference?" At the same time, other scientists pointed out that nonliving processes on Mars also could have created the globules and magnetite clumps that NASA scientists had held up as fossil evidence.

But McKay stands by the hypothesis that his microfossils are from Mars, saying it is "consistent as a package with a possible biological origin." Any alternative explanation must account for all of the evidence, he says, not just one piece at a time.

The controversy has raised a profound question in the minds of many scientists: What does it take to prove the presence of life billions of years ago?

IN 2000, OXFORD PALEONTOLOGIST Martin Brasier borrowed the original Warrawoona fossils from the Natural History Museum in London, and he and Steele and their colleagues have studied the chemistry and structure of the rocks. In 2002, they concluded that it was impossible to say whether the fossils were real, essentially subjecting Schopf's work to the same skepticism that Schopf had expressed about the fossils from Mars. "The irony was not lost on me," says Steele.

In particular, Schopf had proposed that his fossils were photosynthetic bacteria that captured sunlight in a shallow lagoon. But Brasier and Steele and co-workers concluded that the rocks had formed in hot water loaded with metals, perhaps around a superheated vent at the bottom of the ocean—hardly the sort of place where a sun-loving microbe could thrive. And microscopic analysis of the rock, Steele says, was ambiguous, as he demonstrated one day in his lab by popping a slide from the Warrawoona chert under a microscope rigged to his computer. "What are we looking at there?" he asks, picking a squiggle at random on his screen. "Some ancient dirt that's been caught in a rock? Are we looking at life? Maybe, maybe. You can see how easily you can fool yourself. There's nothing to say that bacteria can't live in this, but there's nothing to say that you are looking at bacteria."

Schopf has responded to Steele's criticism with new research of his own. Analyzing his samples further, he found that they were made of a form of carbon known as kerogen, which would be expected in the remains of bacteria. Of his critics, Schopf says, "they would like to keep the debate alive, but the evidence is overwhelming."

The disagreement is typical of the fast-moving field. Geologist Christopher Fedo of George Washington University and geochronologist Martin Whitehouse of the Swedish Museum of Natural History have challenged the 3.83 billion-year-old molecular trace of light carbon from Greenland, saying the rock had formed from volcanic lava, which is much too hot for microbes to withstand. Other recent claims also are under assault. A year ago, a team of scientists made headlines with their report of tiny tunnels in 3.5 billion-year-old African rocks. The scientists argued that the tunnels were made by ancient bacteria around the time the rock formed. But Steele points out that bacteria might have dug those tunnels billions of years later. "If you dated the London Underground that way," says Steele, "you'd say it was 50 million years old, because that's how old the rocks are around it."

Such debates may seem indecorous, but most scientists are happy to see them unfold. "What this will do is get a lot of people to roll up their sleeves and look for more stuff," says MIT geologist John Grotzinger. To be sure, the debates are about subtleties in the fossil record, not about the existence of microbes long, long ago. Even a skeptic like Steele remains fairly confident that microbial biofilms lived 3.2 billion years ago. "You can't miss them," Steele says of their distinctive weblike filaments visible under a microscope. And not even critics have challenged the latest from Minik Rosing, of the University of Copenhagen's Geological Museum, who has found the carbon isotope life signature in a sample of 3.7 billion-year-old rock from Greenland—the oldest undisputed evidence of life on Earth.

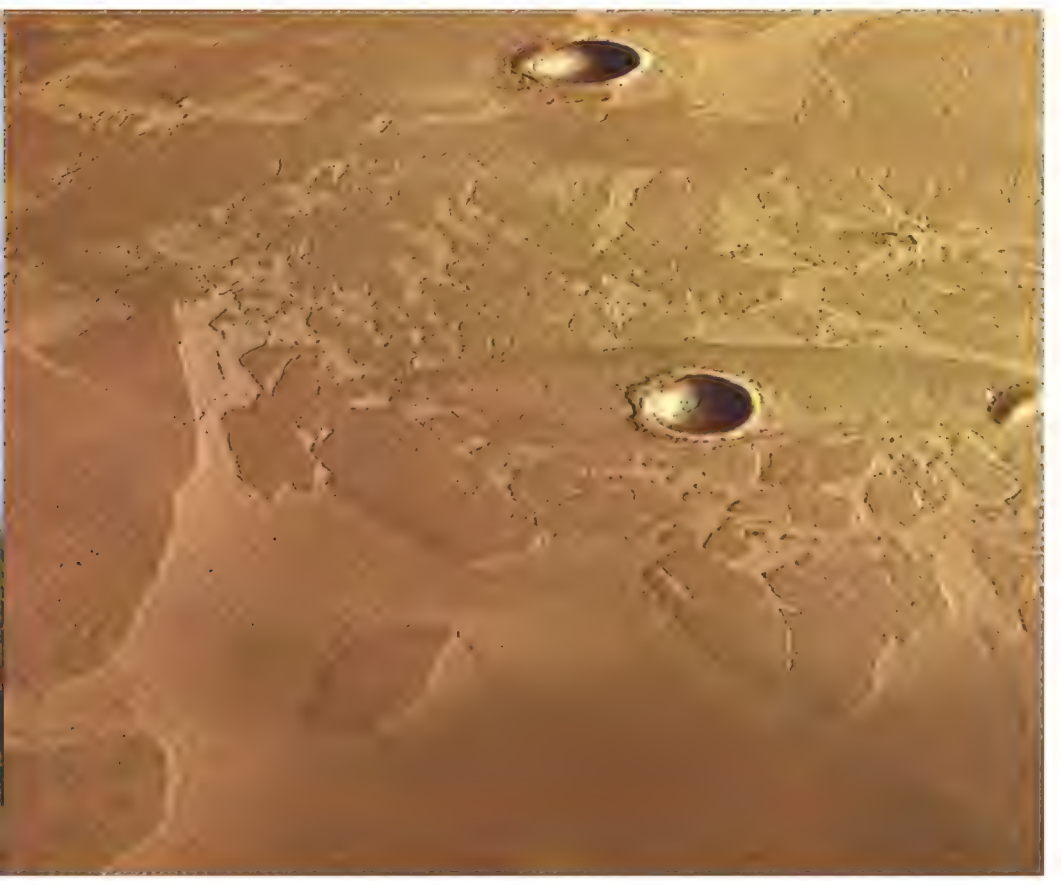
At stake in these debates is not just the timing of life's early evolution, but the path it took. This past September, for example, Michael Tice and Donald Lowe of Stanford

Andrew Steele (right) uses cutting-edge biotechnology in his quest to better identify ancient Earth microbe fossils—not all of which are in dispute. Mats of bacteria called biofilms (left, in fossilized form) have thrived on Earth for at least 3 billion years.

ANDREW STEELE; JAY L. CLENDENIN

University reported on 3.416 billion-year-old mats of microbes preserved in rocks from South Africa. The microbes, they say, carried out photosynthesis but didn't produce oxygen in the process. A small number of bacterial species today do the same—anoxygenic photosynthesis it's called—and Tice and Lowe suggest that such microbes, rather than the conventionally photosynthetic ones studied by Schopf and others, flourished during the early evolution of life. Figuring out life's early chapters will tell scientists not only a great deal about the history of our planet. It will also guide their search for signs of life elsewhere in the universe—starting with Mars.

IN JANUARY 2004, the NASA rovers *Spirit* and *Opportunity* began rolling across the Martian landscape. Within a few weeks, *Opportunity* had found the best evidence yet that water once flowed on the planet's surface. The chemistry of



Possible signs of past water on Mars, such as sea-carved terrain or iceberg shapes, spur theories that life existed there.

EUROPEAN SPACE AGENCY / DLR / FU BERLIN

rock it sampled from a plain called Meridiani Planum indicated that it had formed billions of years ago in a shallow, long-vanished sea. One of the most important results of the rover mission, says Grotzinger, a member of the rover science team, was the robot's observation that rocks on Meridiani Planum don't seem to have been crushed or cooked to the degree that Earth rocks of the same age have been—their crystal structure and layering remain intact. A paleontologist couldn't ask for a better place to preserve a fossil for billions of years.

The past year has brought a flurry of tantalizing reports. An orbiting probe and ground-based telescopes detected methane in the atmosphere of Mars. On Earth, microbes produce copious amounts of methane, although it can also be produced by volcanic activity or chemical reactions in the planet's crust. In February, reports raced through the media about a NASA study allegedly concluding that the Martian methane might have been produced by underground microbes. NASA headquarters quickly swooped in—perhaps worried about a repeat of the media frenzy surrounding the Martian meteorite—and declared that it had no direct data supporting claims for life on Mars.

But just a few days later, European scientists announced that they had detected formaldehyde in the Martian atmosphere, another compound that, on Earth, is produced by living things. Shortly thereafter, researchers at the European Space Agency released images of the Elysium Plains, a region along Mars' equator. The texture of the landscape, they argued, shows that the area was a frozen ocean just a few million years ago—not long, in geological time. A frozen sea may still be there today, buried under a layer of volcanic dust. While water has yet to be found on Mars' surface, some researchers studying Martian gullies say that the features may have been produced by underground aquifers, suggesting that water, and the life-forms that require water, might be hidden below the surface.

"I CAN GET YOU A BETTER PICTURE THAN THAT," ANDREW STEELE TOLD NASA. SOON HE WAS WORKING FOR THE AGENCY. NOW HE'S DESIGNING EQUIPMENT TO PROBE FOR LIFE ON MARS.

Andrew Steele is one of the scientists designing the next generation of equipment to probe for life on Mars. One tool he plans to export to Mars is called a microarray, a glass slide onto which different antibodies are attached. Each antibody recognizes and latches onto a specific molecule, and each dot of a particular antibody has been rigged to glow when it finds its molecular partner. Steele has preliminary evidence that the microarray can recognize fossil hopanes, molecules found in the cell walls of bacteria, in the remains of a 25 million-year-old biofilm.

This past September, Steele and his colleagues traveled to the rugged Arctic island of Svalbard, where they tested the tool in the area's extreme environment as a prelude to deploying it on Mars. As armed Norwegian guards kept a lookout for polar bears, the scientists spent hours sitting on chilly rocks, analyzing fragments of stone. The trip was a success: the microarray antibodies detected proteins made by hardy bacteria in the rock samples, and the scientists avoided becoming food for the bears.

Steele is also working on a device called MASSE (Modular Assays for Solar System Exploration), which is tentatively slated to fly on a 2011 European Space Agency expedition to Mars. He envisions the rover crushing rocks into powder,

which can be placed into MASSE, which will analyze the molecules with a microarray, searching for biological molecules.

Sooner, in 2009, NASA will launch the Mars Science Laboratory Rover. It's designed to inspect the surface of rocks for peculiar textures left by biofilms. The Mars lab may also look for amino acids, the building blocks of proteins, or other organic compounds. Finding such compounds wouldn't prove the existence of life on Mars, but it would bolster the case for it and spur NASA scientists to look more closely.

Difficult as the Mars analyses will be, they're made even more complex by the threat of contamination. Mars has been visited by nine spacecraft, from Mars 2, a Soviet probe that crashed into the planet in 1971, to NASA's *Opportunity* and *Spirit*. Any one of them might have carried hitchhiking Earth microbes. "It might be that they crash-landed and liked it there, and then the wind could blow them all over the place," says Jan Toporski, a geologist at the University of Kiel, in Germany. And the same interplanetary game of bumper cars that hurtled a piece of Mars to Earth might have showered pieces of Earth on Mars. If one of those terrestrial rocks was contaminated with microbes, the organisms might have survived on Mars—for a time, at least—and left traces in the geology there. Still, scientists are confident they can develop tools to distinguish between imported Earth microbes and Martian ones.

Finding signs of life on Mars is by no means the only goal. "If you find a habitable environment and don't find it inhabited, then that tells you something," says Steele. "If there is no life, then why is there no life? The answer leads to more questions." The first would be what makes life-abounding Earth so special. In the end, the effort being poured into detecting primitive life on Mars may prove its greatest worth right here at home.

To see if their molecule-detecting equipment might withstand the rigors of the Red Planet, Steele's co-workers (with rifles at the ready in case of polar bears) field-tested the sensitive machinery on the Arctic island of Svalbard. It worked. And they survived.

KJELL OVE STORVIK

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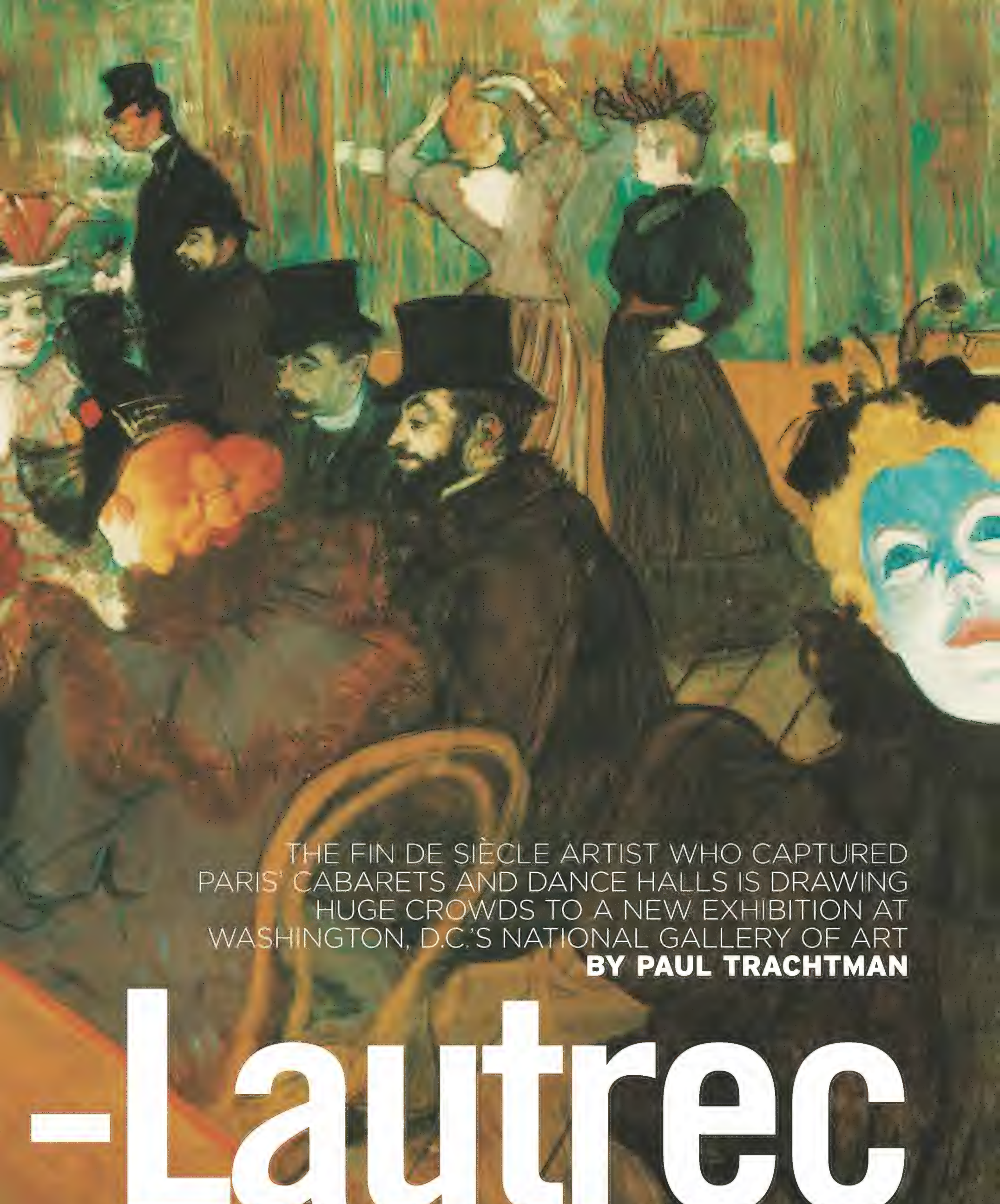
Lautrec (left, c. 1892, age 28), whose growth was stunted by an inherited bone disorder, immersed himself in the boisterous world of Montmartre night life, chronicling the district's diverse clientele and colorful celebrities in works such as *At the Moulin Rouge* (1892-1895). He painted himself into the picture at rear, center.

Toulouse



THE FIN DE SIÈCLE ARTIST WHO CAPTURED PARIS' CABARETS AND DANCE HALLS IS DRAWING HUGE CROWDS TO A NEW EXHIBITION AT WASHINGTON, D.C.'S NATIONAL GALLERY OF ART

BY PAUL TRACHTMAN

-Lautrec

COQUETRY! DEBAUCHERY! CELEBRITY! What more could an ambitious young artist ask for? The spectacle of Paris night life, with its cabaret singers and dance hall stars, offered a new world of scandalous imagery and lurid light that no artist in the last, decadent years of the 19th century had yet made his own—until Henri de Toulouse-Lautrec arrived on the scene.

Famed for its cafés and dance halls (above, the Moulin Rouge, c. 1898), Montmartre was a center of anti-establishment culture.

The scene Lautrec stepped into was in the working-class district known as Montmartre, notorious for its thieves and brothels as well as its hangouts for avant-garde artists and literary anarchists. In 1884 Lautrec was a 20-year-old student in the atelier of the painter Fernand Cormon. At the time, the French art world was divided between academic painters like Cormon, who exhibited their work at the Salon des Artistes of the Royal Academy of Painting and Sculpture, and the upstart Impressionists and other radicals, who showed their paintings at the new Salon des Indépendants.

The radicals had been attacking official French culture for a generation, ever since poet Charles Baudelaire urged painters to depict modern life and painter Gustave Courbet declared that "art must be dragged through the gutter." Lautrec's teacher, Cormon, painted large tableaux of the Stone Age, but he knew his students were drawn to the street life beyond his atelier, and he tolerated their forays into the "gutter." Soon enough, Lautrec was painting by day and carousing by night, sketch pad in hand. Within a decade he would be famous for his spectacular posters of the Moulin Rouge and other Parisian dance halls. More than a century later, his black-stockinged, high-kicking dancers with their layered petticoats and plumed hats remain among the most popular and striking images of modern art.

With an aristocratic pedigree, Lautrec lived off his family's diminishing feudal income from land in the Languedoc region of southern France. He was 4 feet 11 inches tall, having been born with a disorder—most likely from family inbreeding—that gave him a normal torso but shortened legs. He quipped that he could get falling-down drunk without harm, being so close to the floor.

Witty and gregarious, Lautrec liked to be the center of attention. But his heavy drinking and often outrageous behavior caused one close friend, fellow artist François Gauzi, to comment, "Lautrec is seen only as a midget . . . a drunken, vice-ridden court jester whose friends are pimps and girls from brothels." His reputation was hardly redeemed by his friendships with such other social outcasts as Vincent van Gogh and the anarchist writer Felix Fénéon, who had bombed a café in Paris. But Lautrec chose his society with an eye on posterity, and posterity has returned the favor. His life was romanticized in John Huston's 1952 film *Moulin Rouge*, with José Ferrer as Lautrec, and laid bare in Julia Frey's 1994 biography, *Toulouse Lautrec: A Life*. His world and his

New Mexico-based artist PAUL TRACHTMAN *wrote about the restoration of Picasso's* Les Demoiselles d'Avignon *in October 2004.*

JANE VOORHEES ZIMMERLI ART MUSEUM / RUTGERS, STATE UNIVERSITY OF NEW JERSEY; P. 84 BETTMANN / CORBIS; P. 85 ARCHIVO ICONOGRAFICO, S.A. / CORBIS

wild palette were evoked again in Baz Luhrmann's 2001 film, also titled *Moulin Rouge.* His art is currently on display at the National Gallery of Art in Washington, D.C. in the exhibition "Toulouse-Lautrec and Montmartre," which runs through June 12. The exhibition drew more than 9,000 visitors on opening day, March 20—the gallery's largest first-day attendance in 20 years. Co-organized by the Art Institute of Chicago, where it will be on view July 16 to October 10, the show, sponsored by Time Warner, brings together more than 250 works by Lautrec and his contemporaries.

HENRI MARIE RAYMOND DE TOULOUSE-LAUTREC-MONTFA was born on November 24, 1864, in the provincial town of Albi in southwestern France. His father, Alphonse, le Comte de Toulouse-Lautrec, and mother, Adèle Tapié de Céleyran, were first cousins and descendants of one of the oldest and most prestigious families in France. Alphonse, a passionate hunter and flamboyant eccentric (he once showed up in a tutu for lunch at his parents' chateau), was a notorious womanizer, who had little time for his wife or son. But Lautrec, an only child (a younger brother died in infancy), was doted on by his devoutly religious mother, and he would remain dependent on her—and resentful of her—for the rest of his brief life. As an adult living in Paris, he often dined with her before heading off for a night of drunken revelry. Among friends he called her "my poor sainted mother," but when she told him that she'd heard he had been dining with a woman of some elegance, he rebuked the "stupid mistake," assuring her that "the girl in question is nothing but a tart."

Lautrec's father and uncle were talented amateur painters who preferred art that portrayed the animals they hunted and the horses they rode. After some early training in sporting art and a brief, unhappy stint with a master of high-society portraits, the Lautrec who entered Cormon's atelier showed little sign of originality or greatness. At most, a series of sketches he made for a story by a young friend displayed an eye for telling detail. "I have tried to draw realistically and not ideally," Lautrec wrote the friend. "It may be a defect, for I have no mercy on warts, and I like to adorn them with stray hairs, to make them bigger than life and shiny."

As Lautrec became part of the Montmartre scene, he began to be influenced by Impressionism. Atelier students, in fact, often rubbed elbows with the Impressionists and other avant-garde artists at local cafés. Degas, Pissarro, Manet and Cézanne, for example, could be found drinking and arguing at establishments like Le Rat Mort (The Dead Rat) or Le Chat Noir (The Black Cat). But making a mark in a world of such original painters was no easy prospect. Lautrec greatly admired the work of his neighbor Degas, but the elder artist took only passing notice of him, saying some of Lautrec's studies of women in a brothel "stank of syphilis."

Lautrec picked the painting of another neighbor, Renoir, to redo in his own fashion. The subject was the Moulin de la Galette, a dance hall at the top of Montmartre's hill, where shopgirls and laborers showed off their finery and fancy footwork (and pimps and prostitutes lurked in the shadows). Renoir had painted the scene in dazzling Impressionist light, brushing away the Moulin de la Galette's grimmer realities. For his more realistic *Galette* (below), Lautrec made sketches at the hall, then painted the final canvas in his studio. It was immediately reproduced as an illustration in *Le Courrier français,* a popular Paris newspaper, and exhibited at the 1889 Salon des Indépendants. Théo van Gogh, an art dealer, wrote to his brother Vincent about the show: "There are some Lautrecs, which are very powerful in effect, among other things, a Ball at the Moulin de la Galette, which is very good."

Three years earlier Vincent had briefly studied beside Lautrec in Cormon's atelier and the two had become friends. Vincent invited Lautrec to take part in an exhibition of new artists in a working-class restaurant in Paris in 1887. On Lautrec's advice, Vincent left Paris for Arles shortly after, and Théo soon became Lautrec's first art dealer. (The three, in fact, lunched together in Paris just three weeks before Vincent fatally shot himself in 1890.)

In a letter to Théo from Arles, Vincent had compared one of his own portraits to a Lautrec portrait of a woman in thick

Lautrec's first major dance-hall painting, *Moulin de la Galette* (1889), displays his interest in the underlying drama, as well as the surface appearance, of the scene.

FRANCIS G. MAYER / CORBIS

white face powder for the stage. The Lautrec (*Poudre de Riz,* or *Rice Powder*), he suggested, "would appear even more distinguished by the mutual contrast and . . . my picture would gain by the odd juxtaposition, because that sun-steeped, sunburned quality, tan and air-swept, would show up still more effectively beside all that face powder and elegance."

By 1888, Lautrec's works had begun to sell, and when the dazzling new Moulin Rouge dance hall opened in Montmartre the following year, one of his circus paintings graced the entrance hall. Because only the more adventurous of bourgeois Parisians would risk a night out in the sordid precincts of Montmartre, the Moulin Rouge was set on the affluent edge of the district to attract a broader public. In 1891 the owner again turned to Lautrec, commissioning him to create a poster promoting the cabaret.

The big attraction at the Moulin Rouge was a strawberry-blonde dancer named Louise Weber, better known as "La Goulue" (the Glutton). A former laundress and part-time prostitute, she had first won note at the Moulin de la Galette dancing the *chahut* (slang for chaos), an erotic cancan. She claimed to have modeled for Renoir, and was otherwise noted for kicking the top hats off men's heads as she danced. One patron described her as "a strange girl, with a vampire's face, the profile of a bird of prey, a tortured mouth, and metallic eyes." Lautrec had painted her before, and he made her the focus of his poster's design.

More than six feet high and half as wide, the poster (right) showed La Goulue onstage with a leg in the air; a male dancer in the foreground gawks at her revealing petticoats. Everything about it was visually radical—its scandalous image, strong flat forms borrowed from Japanese prints, black silhouettes drawn from the shadow plays in vogue at Le Chat Noir, bold lettering, and graphic inventions of Lautrec's own devising. He used the yellow globes of electric stage lights—new in Paris—for instance, to make vivid patterns across the poster, a touch of abstract art no one had seen before.

The poster was made by color lithography—a process in which the image is drawn on a limestone plate that is then inked and printed. Lautrec had to learn the method from the printer as he worked. Because of its size, the poster had to be divided and printed from three stones, then assembled from the separate strips of paper. In late 1891, some 3,000 copies of it appeared on walls around Paris. Parisians were used to the rococo designs of posters by artist Jules Chéret, but Lautrec's image was something altogether new. "I still remember the shock I had when I first saw the Moulin Rouge poster . . . carried along the avenue de l'Opéra on a kind of small cart," one Parisian remembered. "And I was so enchanted that I walked alongside it on the pavement."

Other Lautrec posters and prints followed, helping to define Paris in the 1890s, a decade known as the Belle Epoque. The swagger of the singer-songwriter Aristide Bruant, with his black cape, broad hat and red scarf; the black-stockinged dancer Jane Avril, with her swirl of orange skirt and pale face punctuated by open red lips; the trademark long black gloves and puckered mouth of cabaret performer Yvette Guilbert—Lautrec captured the essence of these stars, and his images fixed them in the firmament of the Paris night.

His posters became so popular, in fact, that some Parisians were known to follow the workmen hanging them, so they could peel them off walls before the glue dried. "Who will deliver us from the likeness of Aristide Bruant?" the newspaper *La Vie parisienne* lamented. "You can't go anywhere without finding yourself face to face with him."

By the late 1890s, Lautrec had exhibited his work on the European continent, in England and in the United States, designed theater sets, and added new techniques to the art of lithography. But the "Beautiful Epoch" was not all about the beautiful, and Lautrec was also a part of its darker side. His liaisons in the brothel world, for instance, were not all artistic. It was his boast that he preferred unadorned sex to love. "Ah, love! Love!" he proclaimed to Yvette Guilbert. "You can sing about it in any key you want . . . but hold your nose, my dear, hold your nose! Now if you sang about desire, we would understand each other . . . but love! . . . There is no such thing." Guilbert called him "My little monster."

An artists' model named Suzanne Valadon, a talented painter herself and the woman Lautrec described to his mother as "nothing but a tart," came as close as anyone to capturing his heart, according to Lautrec biographer Julia Frey. By

In 1891, Paris was plastered with some 3,000 copies of Lautrec's first poster, *Moulin Rouge: La Goulue.* The image's popularity made Lautrec a celebrity overnight.

ART INSTITUE OF CHICAGO, MR. AND MRS. CARTER H. HARRISON COLLECTION

some accounts, they were lovers for several stormy years. But if there was little romance in Lautrec's life, there were many friends, prominent among them Jane Avril, who was nicknamed *La Mélinite* after a type of explosive. A British art student, William Rothenstein, who hung out with the crowd at the Moulin Rouge, described her as "a wild, Botticelli-like creature, perverse but intelligent, whose madness for dancing induced her to join this strange company." Just as Avril inspired some of Lautrec's most striking posters—the last one he produced depicts her with a snake coiled around her skirts—she is also rendered in some of his most tender portraits. Avril saw Lautrec in his best light, condoning even his relationships with prostitutes. "They were his friends as well as his models," she later wrote. "In his presence they were just women, and he treated them as equals."

In both his way of life and choice of friends, Lautrec profoundly offended his aristocratic family. His father partly disinherited him, and an uncle burned several of his paintings. Only his mother stayed close to him as long as she could bear to—near the end of his life, she fled Paris to be away from him—and continued to support him from a distance.

In Lautrec's generation, French anarchism could turn violent. A bomb was tossed into the legislature in 1893, and French president Sadi Carnot was assassinated the next year. But in Montmartre, anarchy was being translated from acts of terror into radical art. Lautrec contributed illustrations to several literary journals of an anarchist bent, and was friends with members of a group called the Incoherents, whose ideas foreshadowed the art of Dada and Surrealism. Their first show, held in a private apartment, included a portrait of a postman with his worn-out shoe protruding from the canvas; later shows featured an all red canvas titled *Tomato Harvest by Apoplectic Cardinals on the Shore of the Red Sea* and a doctored Mona Lisa smoking a pipe—30 years before Marcel Duchamp's famous Mona Lisa with a goatee.

While Lautrec didn't produce political or absurdist art, his unconventional realism, embrace of commercial art, eye for celebrity and increasingly abstract graphic designs positioned him among the most modern of artists. He was making a place for himself that is much closer to Picasso than to Degas. Indeed, when Picasso arrived in Paris, in 1900, he sketched a Lautrec poster into one of his own paintings. Even now Lautrec remains modern: in his prints of celebrities he can be seen as the Andy Warhol of his era, his La Goulue and Jane Avril prefiguring Warhol's Marilyn Monroe.

Lautrec, however, seemed driven to squander his glory by drinking himself into the grave. At the height of his success there were nights when he disappeared, eventually dragging

In his posters and paintings, Lautrec immortalized Montmartre's cabaret and dance hall figures. Clockwise, from top: Singer Yvette Guilbert, singer-songwriter Aristide Bruant, dancer Jane Avril and "La Goulue."

STATE PUSHKIN MUSEUM OF FINE ARTS, MOSCOW / ART RESOURCE; MUSEUM OF MODERN ART, NEW YORK / ART RESOURCE; STERLING AND FRANCINE CLARK ART INSTITUTE, WILLIAMSTOWN, MASSACHUSETTS; PETER HARHOLDT / CORBIS

NATIONAL GALLERY OF ART, WASHINGTON, DC. COLLECTION OF MR. AND MRS. JOHN HAY WHITNEY

Lautrec "conquered the women . . . he admired—in his art," wrote one biographer. He "seduced them by painting them, possessed them with the brush." The artist portrayed the provocative Marcelle Lender dancing the Bolero in 1895-96.

himself back through the gutter as if taking Courbet's prescription quite literally. In one macabre episode, he discovered Victorine Meurent, who had posed naked for Manet's daring 1863 painting *Olympia*, living in abject poverty in a top-floor apartment down a Montmartre alley. She was now an old, wrinkled, balding woman. Lautrec called on her often, and took his friends along, presenting her with gifts of chocolate and flowers—as if courting death itself.

Toward the end, hallucinations and paranoia, induced by alcoholism and syphilis, overwhelmed him. On one occasion when he was visiting friends in the country, they heard a shot from his room, and found him sitting on his bed with a pistol, armed against "attacking" spiders. Eventually he was locked up in an asylum, where, like his friend Van Gogh, he continued to work; in a burst of artistic energy, he produced a brilliant series of circus drawings from memory to convince his doctors he was sane. After 11 weeks, he was released, but he was soon drinking again. He spent his last days in his mother's garden, where he had often painted her, and died in her arms in 1901, shortly before his 37th birthday. In Paris, his spirit lived on. Picasso was making his own sketches of the singer Yvette Guilbert, and he had asked Jane Avril to reminisce about her friend Lautrec. Like him, Picasso was painting scenes of the brothel and the circus, and he was living in Montmartre.

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MORTAL SICKNESS AMONG THE INDIANS.

On may 4, 1837, Francis A. Chardon, the churlish head trader at Fort Clark, a fur-company outpost on the Upper Missouri River, reported in his journal, "Last night the Cock crowed five times." The superstitious Chardon then added: "Bad News from some quarter is expected."

But with the severe winter over, and the ice-clogged river finally thawed, Chardon's mood inched toward optimism. The nearby Mandan and Hidatsa tribes had gathered hundreds of packs of bison robes. Traders and Indians alike were eagerly awaiting the arrival of the steamboat *St. Peters*, churning upriver from St. Louis to pick up the furs and drop off its annual load of supplies from Pratte, Chouteau & Company, the western branch of John Jacob Astor's former American Fur Company.

The *St. Peters*, a 119-ton side-wheeler, docked at Fort Clark on June 19 and unloaded trade goods and Indian provisions. Also aboard was Chardon's 2-year-old son, Andrew Jackson Chardon, whom he had fathered with a handsome Lakota Sioux woman, Tchon-su-mons-ka. That night the crew members of the *St. Peters* joined in a boisterous "frolick," singing and dancing with the men and women at the Mandan's bustling village of Mit-tutta-hang-kush.

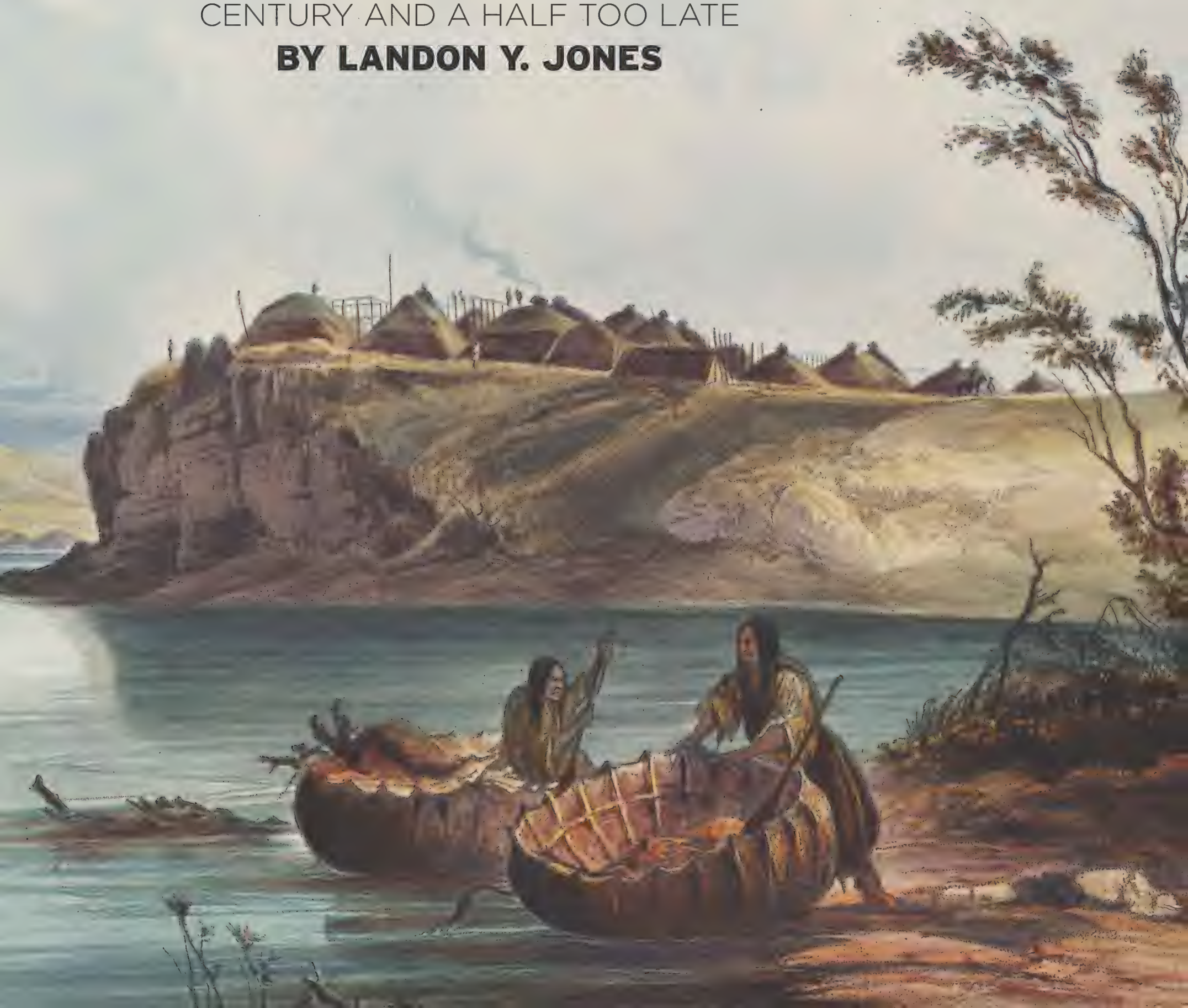
The next day the *St. Peters* headed upstream toward Fort Union, at the mouth of the Yellowstone. But in its wake it

Earth lodges protected the Mandan Indians in their village of Mit-tutta-hang-kush, overlooking the Missouri River in this painting from 1833. But the lodges would seal their fate a few years later, when smallpox spread quickly inside the communal houses. Only one in ten Mandan survived the epidemic of 1837-38, which killed thousands of Native Americans across the high plains.

TRIBAL FEVER

TWENTY-FIVE YEARS AGO THIS MONTH, SMALLPOX WAS OFFICIALLY ERADICATED. FOR THE INDIANS OF THE HIGH PLAINS, IT CAME A CENTURY AND A HALF TOO LATE

BY LANDON Y. JONES



Jumping-off point for explorers, fur traders and settlers, St. Louis (c. 1849) was the "Gateway to the West." Infected travelers on a side-wheeler kicked off the epidemic.

HENRY LEWIS / BEINECKE RARE BOOK AND MANUSCRIPT LIBRARY, YALE COLLECTION OF WESTERN AMERICANA; P. 92 GRANGER COLLECTION, NEW YORK; P. 93 M. VON WIED-NEUWID / BEINECKE RARE BOOK AND MANUSCRIPT LIBRARY, YALE COLLECTION OF WESTERN AMERICANA; P. 95 GEORGE CATLIN / SMITHSONIAN AMERICAN ART MUSEUM

left a ticking time bomb. In addition to its cargo of supplies, the steamboat had been carrying several passengers and crewmen infected with variola major, the lethal virus feared for thousands of years by its better-known name: smallpox.

Smallpox had previously swept across the high plains from Mexico in the late 18th century, ravaging the Mandan and other tribes such as the Ojibwa, Pawnee and Arikara, whose population fell by as much as two-thirds. But by the 1830s the Mandan and the other tribes of the Upper Missouri had largely outlived their acquired immunity to the disease, and none had been inoculated or vaccinated. As a result, the voyage of the *St. Peters* triggered one of the most catastrophic epidemics recorded on the North American continent. "There is nothing in our experience we can compare it to," says W. Raymond Wood, an anthropologist who has studied Plains Indian cultures. "It was completely devastating."

The disease had announced itself when a *St. Peters* crew member had showed symptoms on May 2, two weeks after the boat left St. Louis. Ignoring suggestions that the man be put ashore, the 33-year-old captain, Bernard Pratte Jr., said he needed every available hand to bring back to St. Louis the packs of profitable furs his company was expecting.

Chardon reported the first Mandan death from smallpox on July 14, less than a month after the side-wheeler left Fort Clark. Then Indians began dying at an accelerating rate—at first, two or three a day; later, entire families of eight or ten persons at once. "I Keep no a/c of the dead, as they die so fast that it is impossible," Chardon wrote. Soon his young son Andrew would join them.

The deaths were as horrifying as they were numerous. Victims experienced high fever, chills and excruciating pain. With blood pouring from their mouths and ears, they often died even before the appearance of smallpox's characteristic pustules. In a futile effort to find relief, sufferers threw themselves into water and rolled in hot ashes. Husbands and wives committed mutual suicide, stabbing themselves with arrows and knives, or leaping off cliffs. Chardon reported that one Mandan woman, after watching her husband die, killed her two children and "to complete the affair she hung herself."

In scenes that might have been painted by Goya, bodies piled up in the village too rapidly to be buried and were dumped into the river. "This Morning two dead bodies, wrapped in a White skin, and laid on a raft passed by the Fort, on their way to the regions below," Chardon reported, adding sardonically, "May success attend them." After estimating that

St. Louis native LANDON Y. JONES *is the author of* William Clark and the Shaping of the West, *published last year.*

"I WILL CHEERFULLY RISK AN EXPERIMENT," A U.S. OFFICIAL SAID OF HIS PLAN TO TAKE THE VACCINE UPRIVER, "WHICH MAY PRESERVE THE LIVES OF FIFTEEN OR TWENTY THOUSAND

800 Mandan had died by mid-September, Chardon—who never concealed his contempt for Indians—commented, "What a bande of RASCALS has been used up."

The pandemic was no less terrifying elsewhere along the river. At Fort Union, the post at the junction of the Missouri and Yellowstone rivers, traders bungled an attempt to inoculate Indian women living there with scabs taken from a victim. Dozens of Indians died, as did whites who had not been inoculated, and the stench of decaying bodies inside the post was palpable 300 yards away. When one party of Assiniboine arrived outside the post's walls, they were persuaded to leave only after the traders lifted an infected boy above the pickets, displaying for the visitors his ghastly face that "was still one solid scab," as one of the traders later wrote.

Reports of the immensity of the horror on the Upper Missouri soon began to trickle eastward. William Fulkerson, who oversaw local Indian affairs from his base at Fort Clark, wrote to the explorer William Clark, at the time Indian superintendent in St. Louis, that "the small pox has broke out in this country and is sweeping all before it—unless it be checked in its mad career I would not be surprised if it wiped the Mandans and Rickaree [Arikara] tribes clean from the face of the earth."

Friendly to whites most of his life, Mandan chief Four Bears (in an 1832 portrait by George Catlin) turned bitter as death approached, blaming them for the disease that would kill him.

Clark forwarded Fulkerson's letter to his superiors at the War Department back in Washington, D.C. But most of the federal government appeared to shrug off the impending disaster, following a familiar pattern: five years earlier, Secretary of War Lewis Cass had cut off funding of a vaccination program for the Indians in the Upper Missouri, apparently not wishing the doctors to proceed as far upriver as the pro-British Blackfeet. The powerful Chouteau family, which controlled fur trade on the Missouri, had likewise blocked a vaccination program because it would have delayed Indian hunting parties from leaving for their profitable trips to the high plains.

But this time, in the face of widespread administrative indifference, one U.S. official finally decided to take action. Joshua Pilcher, a 47-year-old Virginian, had just been appointed to take charge of the Sioux Agency at Fort Kiowa, north of today's Chamberlain, South Dakota. Traveling to his new post on board the *St. Peters* during its fateful trip, Pilcher had observed the disease spreading among passengers on the ship before he disembarked at his post, downriver from Fort Clark. Quickly realizing the nature of the unfolding calamity, Pilcher sent out messengers from Fort Kiowa to warn the nomadic Lakota and Nakota Sioux still hunting on the plains to stay away from the river in order to avoid contagion.

By the time he returned to St. Louis that winter, Pilcher had pieced together the first overall estimate of the extent of the tragedy. In just seven months since the first death, the Mandan had been reduced from 1,600 people "to thirty-one persons," he wrote to Clark in February 1838. (Scholars now believe that there were 100 to 200 actual survivors.) Half of the Hidatsa had died, as had half of the Arikara. "The great band of [Assiniboine], say ten thousand strong, and the Crees numbering about three thousand have been almost annihilated. . . . The disease had reached the Blackfeet of the Rocky Mountains. . . . All the Indians on the Columbia River as far as the Pacific Ocean will share the fate of those before alluded to." In short, Pilcher told Clark, the Great Plains were being "literally depopulated and converted into one great grave yard."

But what to do? Pilcher reasoned that it was not too late to save the bands of nomadic Sioux whom he had warned away from "the fatal destroyer" over the summer—and were still on the plains. He proposed going upriver with a doctor and $2,000 in presents. They would try to locate the Sioux and persuade them to accept vaccination with the milder form of variola called cowpox. This vaccine, developed by the Englishman Edward Jenner in the 1790s, had proved so effective

"FOR OUR PEOPLE THIS IS HALLOWED GROUND, A SACRED SPOT," SAYS NATIVE AMERICAN EDUCATOR AMY MOSSETT. "WE MUST TREAT IT WITH REVERENCE."

Impressions left by earth lodges dot the North Dakota ground where a Hidatsa village once stood, now a national historic site. Fully half of the Hidatsa tribe died when smallpox struck.

NATIONAL PARK SERVICE

that Jefferson had urged Lewis and Clark to carry it with them on their historic expedition. (Their supply was damaged in transit and never used.)

As Pilcher observed, "It is a very delicate experiment among those wild Indians, because death from any other cause, while under the influence of vaccination, would be attributed to that and no other cause." Nevertheless, he wrote to Clark, "If furnished with the means, I will cheerfully risk an experiment which may preserve the lives of fifteen or twenty thousand Indians."

It was a bold and seemingly quixotic undertaking. The Indians were profoundly embittered toward the white traders who had inflicted the malady upon them, and some sought revenge. Chardon himself received several death threats and narrowly escaped an assassination attempt at Fort Clark. In a speech found among Chardon's papers—the authenticity of which is doubted by some scholars—the dying Mandan chief Four Bears denounced the whites as "a set of Black harted Dogs, they have deceived Me, them that I always considered as Brothers, has turned Out to be My Worst enemies." Four Bears allegedly went on to say that "my face is so rotten" that "even the Wolves will shrink in horror at seeing me," and urged his warriors to "rise all together and Not leave one of them alive."

The War Department, feeling pressure from church groups to take action to relieve the Indians' suffering, approved Pilcher's plan. But the agent needed to locate a doctor willing to enter the dangerous borderlands on the Middle and Upper Missouri, at a wage of $6 a day, to vaccinate the Indians. Who would risk such a perilous trip?

Pilcher would find his man in an unlikely spot: the rough-house streets and saloons of St. Louis. Dr. Joseph DePrefontaine, who was apparently having little success in medicine, had started a new career in theatrical management—and had become notorious for his barroom carousing. In March 1838, DePrefontaine had been ordered out of his employer's theater for rolling on the floor and singing during a performance of *Hamlet*. Undeterred, DePrefontaine took his revenge by writing newspaper articles attacking the theater.

Swallowing whatever doubts he may have harbored, and with no other applicants breaking down his door, Pilcher hired DePrefontaine. By April 1838, ten months after smallpox first hit the Mandan, the two men were ready to head up the Missouri to look for Sioux. At the St. Louis levee, they boarded the steamboat *Antelope* and proceeded upriver, making the usual stops at Fort Leavenworth and the Black Snake Hills near present-day St. Joseph, Missouri.

Once past Council Bluffs, in what is now Iowa, Pilcher

and DePrefontaine prepared to face tribes angry at whites and suspicious of vaccinations. Instead, they were astonished to find that the Indians had not only lost their fear of vaccinations but were eagerly seeking them. The two men stopped to vaccinate the Oto, Omaha and Santee Sioux. Just below the Sioux Agency at the mouth of the White River, they found "three or four thousand" Sioux who had gathered for the annual distribution of presents and annuities mandated by the Indians' treaties with the U.S. government. "Having explained to the Indians the object of the physician, he commenced vaccinating," Pilcher reported later in a letter to Clark. DePrefontaine soon found himself so inundated by "the mass of men, women and children that crowded around me" that he gave up any effort "to keep an account of ages, sexes, etc." Working rapidly, he ran out of the vaccine supplied by the War Department and was forced to acquire more on his own, presumably from traders.

After the food and supplies were distributed to the hungry tribes, the Indians quickly departed, Pilcher wrote, like "a flock of Crows rising from a dead carcass—they are suddenly gone, and in a few hours are spread over the Country in every direction, in numerous small bands." The two men continued upriver, vaccinating isolated bands of Yankton, Oglala and Saone. By the time the *Antelope* reached Fort Pierre, 1,500 miles above St. Louis, DePrefontaine estimated he had given 3,000 vaccinations, though Pilcher believed the actual total was far larger.

But DePrefontaine had not yet located several large bands of nomadic Lakota still hunting somewhere in the vast plains between the Missouri River and Rocky Mountains. Pilcher furnished him with more vaccine and sent him overland on horseback. His instructions were to find the Sioux, or to return to Fort Pierre in three weeks.

Unfortunately, the mission was only a partial success. DePrefontaine himself fell ill from an unnamed malady "in the Prairies and was not so successful in finding the Indians as I anticipated," Pilcher reported. Still, DePrefontaine located "several small bands, and operated on all that he found."

A few months later, Pilcher was able to tell his superiors that the epidemic had finally subsided. He returned to St. Louis and eventually went on to serve as Clark's replacement as superintendent of Indians. DePrefontaine continued to vaccinate tribes on the Missouri for at least two more years. But as often on the frontier, there was a fine line between humanitarian and rogue. In the 1840s, the mercurial doctor was identified as a member of a gang that robbed and murdered a Spanish merchant on the Santa Fe Trail. He later was reported to have been involved in an attempt to assassinate Frank P. Blair Jr., a prominent antislavery activist and future U.S. senator.

Pilcher and DePrefontaine may well have felt that their efforts did not make much difference in the end. The vaccination campaign saved thousands of lives—but as many as 20,000 Indians had perished across the high plains. Ninety percent of the Mandan died. "In human terms, their culture was massively impoverished," says anthropologist W. Raymond Wood. "The epidemic ravaged their economy, their arts, their social systems and their kinship systems." And the epidemic had a monumental effect on the destiny of the West: "By reducing the number of Native Americans," Wood says, "it made settlement simpler for whites."

While many Native Americans today are descended in part from the Mandan, there are no full-blooded Mandan left. Only a handful of teachers still know the Mandan language. "When those people leave us, they are going to take the language with them," says Amy Mossett, a Mandan-Hidatsa educator and interpreter of the life of Sacagawea, the famed Indian woman who helped guide Lewis and Clark. Mossett lives in North Dakota, not far from the site of the old Fort Clark and Four Bears' village. "I go out to that site every now and then," she says. "It's usually real quiet, and I remember one July walking through the depressions left by earth lodges that stood there. It was searing hot, and I could see the heat waves dancing on the prairie. I remember wondering if our ancestors saw those heat waves before they slipped into delirium, then death." Now, she says, "for our people this is hallowed ground, a sacred spot. We must treat it with reverence."

Says Amy Mossett of North Dakota, who is herself part Mandan: "As long as the blood of the Mandan flows through our heart, we're still here."

JASON LINDSEY

This month marks the 25th anniversary of the World Health Organization's official declaration of the elimination of smallpox from the earth. It's been even longer, since 1949, that a single case was reported in the United States. But the variola virus itself still exists in the form of samples retained for research in Siberia and at the Centers for Disease Control and Prevention in Atlanta—leading scientists and homeland security officials to raise the specter of other samples potentially finding their way into the hands of bioterrorists. If that were to happen, the human population would be susceptible to a resurgence of smallpox. Without acquired immunities or widespread vaccinations, "to some extent we're in the same boat Native Americans were in before 1492," points out Duke University professor Elizabeth Fenn, author of *Pox Americana,* a history of the disease. "We're approaching 100 percent vulnerability."

HOMAGE TO THE ANCHOVY COAST

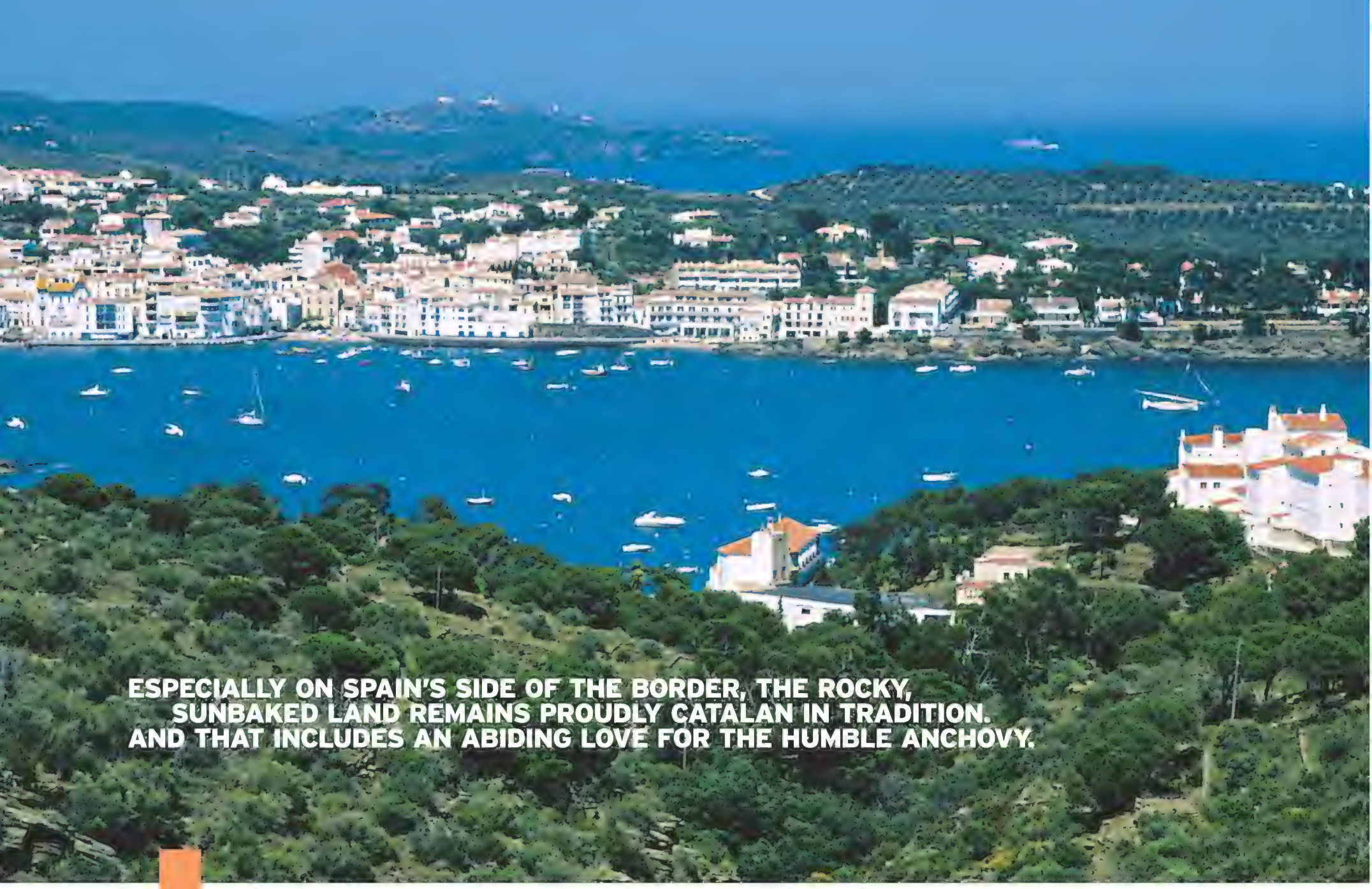
YOU MAY NOT WANT THEM ON YOUR PIZZA, BUT ALONG THE
THEY'RE A PRIZED DELICACY—AND A CULTURAL TREASURE

Locals reenact the arrival of 17th-century ships in l'Escala, as the Catalan town celebrates the Festival of Salt and the Anchovy. Dinner, served on the beach, features bread smeared in tomato and crowned with anchovies (right).

MEDITERRANEAN

BY CHRISTOPHER HALL

PHOTOGRAPHS BY TINO SORIANO



ESPECIALLY ON SPAIN'S SIDE OF THE BORDER, THE ROCKY, SUNBAKED LAND REMAINS PROUDLY CATALAN IN TRADITION. AND THAT INCLUDES AN ABIDING LOVE FOR THE HUMBLE ANCHOVY.

Blue sky meets blue sea on the Anchovy Coast, where tourism now drives the economy. Cadaqués (above) lies between the two pillars of anchovy preparation, Collioure and l'Escala.

JOAN CARLES NINOU smiles broadly and laughs easily, signs of a man who can appreciate life's jollier moments. But get him talking about anchovies and you'll soon realize that a serious streak runs through him, a streak as deep as the Mediterranean Sea that washes the coves and craggy headlands of his native Catalonia.

A boisterous lunchtime crowd fills El Xampanyet, Ninou's storefront café tucked away in the cobblestone labyrinth of Barcelona's Ribera Quarter. As he pours wine or rings up a bill, Ninou chats in Catalan with a lively mix of blue-collar and office workers seated at small tables or bunched along a marble bar covered with platters of bright red marinated peppers, herb-flecked olives and other *tapas*. An animated man with hair cropped so close it looks like a shadow on his shiny, round head, Ninou also has two of the most expressive eyebrows I've ever encountered, a matched pair of fuzzy, black caterpillars whose rise and fall mark the tempo of his conversation. And when the topic turns to anchovies, as it inevitably does at El Xampanyet, the eyebrows shift into double time.

"The ancient Greeks brought the art of salting fish to Catalonia," Ninou says. "And almost since that time, anchovies have been a part of our life here."

El Xampanyet doesn't go back quite as far as Aristotle—only to 1929, when Ninou's grandfather opened the place—but house-cured anchovies have been its specialty for decades. From my perch next to the tapas, I watch as a barman vigorously rinses five-inch-long anchovy fillets in fresh, running water to remove any excess salt. Across the room I spot a customer in blue coveralls drinking beer and downing the little fish like a trained seal: picking each one up by its tail, tilting his head back and lowering it into his mouth. I try a few myself, seal-style, and discover that with their ruddy brown color, firm texture and rich, meaty taste, they bear no resemblance whatsoever to the mushy, gray slivers of sharp fish-salt flavor that pass for anchovies in most of the world. Locals will tell

This is the first SMITHSONIAN *piece for San Francisco-based writer* CHRISTOPHER HALL. *Usually a globe-trotter, Barcelona photographer* TINO SORIANO *stayed close to home for this story.*

BETHUNE CARMICHAEL / LONELY PLANET IMAGES; MAP: MIKE REAGAN

you that what makes a Catalan anchovy special is the traditional way in which it's cured, and Ninou's may be the best anchovies in all of *els països Catalans*—the Catalan lands. Unless, perhaps, you count those I tasted the day before at La Boqueria, Barcelona's vast and bustling covered market. Or those from the Costa Brava towns of l'Escala and Cadaqués, or from the port of Collioure, across the border in France, renowned for the artisanal salt-curing of anchovies since medieval times.

You won't find the words "Costa de l'Anxova" on any map, but that doesn't mean it's not a real place. Catalan for Anchovy Coast, the name aptly describes a roughly 50-mile stretch of Mediterranean shore that lies mostly in Catalonia, the northeasternmost region of Spain, but that also spills over into southwestern France, where residents retain cultural and linguistic ties with their Catalan neighbors. Though each country has nicknamed its coast—Costa Brava, or Wild Coast, in Spain, and Côte Vermeille, or Vermilion Coast, in France—in truth the region is neither exclusively Spanish nor French. A rocky, sunbaked land whose picturesque ports and lapis waters have captivated landscape painters for a century, it remains proudly Catalan in tradition, especially on the Spanish side of the border. And this includes not only a fierce devotion to the Catalan tongue, a Romance language that's been around for a thousand years, but also an abiding love for the humble anchovy.

For Americans accustomed to anchovies as a salty jolt to Caesar salad or pizza—or, more commonly perhaps, as something to be avoided at all costs—the Catalan treatment of the fish, both fresh and preserved, is a revelation. Though it also figures in many other Mediterranean cuisines, along the Anchovy Coast it assumes dozens of fetching guises—from traditional preparations like *boquerónes* (pickled fresh anchovies), anchovy-chard fritters, puff pastry with anchovy butter, and an anchovy and pine nut topping for the pizza-like *coca*, to more recent creations like an hors d'oeuvre of deep-fried anchovy bones, a bright-tasting tartare of *seitó* (the Catalan name for the fresh anchovy) and a sauté of anchovies and apples that reflects the Catalan taste for sweet-and-salty dishes. What's more, for some Catalans, the anchovy assumes near-Proustian significance. The great 20th-century Catalan author Josep Pla wrote—with tongue only partly in cheek—that you'll remember the anchovies of l'Escala for quite a while, though not forever, since in time you might confuse them with your first love.

"The anchovy is a quintessential Catalan product with a long tradition," says internationally acclaimed chef Ferran Adrià, who has managed to stretch that tradition at El Bullí, his restaurant in the Costa Brava town of Rosas, with dishes like anchovy-topped grilled watermelon and anchovy gelato. I've met Adrià at the annual anchovy and salt festival in l'Escala, where he has come to receive the town's Golden Anchovy award for promoting its flagship product. A pale, thoughtful man with profoundly brown eyes, he recalls how, as a child, his mother used to salt anchovies each summer at their home on the outskirts of Barcelona. But Adrià's fond memories are shadowed by worry. He tells the fishermen, salters and other townsfolk assembled at city hall that Catalan anchovies are being threatened as never before, and he names a twin menace—a diminished Mediterranean catch and the onslaught of fast-food culture. "If we're not careful," he warns, "in five years our tradition may be lost."

BECAUSE MOST OF THE WORLD'S hundred-plus species are easily damaged when caught with a net, the only anchovy you're likely to find in a restaurant or on store shelves is the hardy *Engraulis encrasicolus*, commonly known as the European anchovy. A slender, silvery blue-green creature with a pointy snout and forked tail, it can grow nearly eight inches long in its three-year life, though often it's caught before reaching that size. The small fish has an unusually large jaw—hence one of its Spanish names, *boquerón*, or "big mouth."

"Many of my American customers," says Joan Carles Ninou, holding an anchovy in his Barcelona café, "won't try them, even after I say they're the house specialty."

GRACEFUL BOATS ONCE GLIDED OUT OF THE HARBOR EACH NIGHT, WITH ANCHOVIES SOLD OUT OF WICKER BASKETS ON THE BEACH THE NEXT MORNING.

The anchovy had been a regional specialty for 2,000 years when this photograph was taken in 1910. Today, traditional fishermen (below) face competition from jumbo vessels.

Found in coastal waters of the eastern Atlantic from Norway to South Africa, as well as in the Mediterranean, Black and Azov seas, European anchovies swim in compact schools and feed on plankton and other nutrients during the day, dispersing into shallower waters at night. They love a full moon and traditionally are fished using a light known as a *lamparo*. Suspended from the prow of a small boat floating within the perimeter of a purse seine net, the light mimics the moon and lures the fish to the surface.

The anchovy has been fished and preserved along the Mediterranean for millennia. In the bestselling *Salt: A World History*, author Mark Kurlansky writes that of all the region's salted fish—which historically have included tuna, sardines, herring and eel—anchovies have been the most highly praised since the time of the Greeks, who took salted fish so seriously they dreamed up words to describe the type of cure, the origin of the fish and whether it was salted with or without scales. Anchovies often went into *garum*, the pungent fermented fish sauce favored by Roman empire-builders—and alternately described in contemporary accounts as heavenly or putrid—and fish from Catalonia were thought to make a superior version.

The extensive Greco-Roman ruins of Empúries, a deserted complex of stone walls, mosaic fragments and temple columns just outside l'Escala, bear witness to the ancient origins of the Catalan anchovy. One of the most important archaeological sites in Catalonia, Empúries was the point of entry to the Iberian Peninsula for Greek, and then Roman, culture, including Greek techniques for preserving fish with salt. From Empúries, the knowledge traveled to Naples and Sicily, which eventually became important fish-salting centers.

Visiting the once-thriving commercial port on a bright October afternoon, just after a ferocious storm had lashed it with rain and sent huge waves crashing into a 2,000-year-old stone jetty, I came across the excavations of a first-century workshop specializing in fish preserves and sauces. Time and the elements have reduced it to low walls of dry masonry, but I could pick out the central patio where fish were cleaned, and rooms where they were salted and stored in jars. Long after most of Empúries was abandoned in the third century,

TOP: JOSEP ESQUIROL / ARCHIVE OF L'ESCALA

the workshop techniques continued to be used by successive generations of local fishermen, who in the 16th century founded l'Escala and its anchovy factories. By the 18th century, salted anchovies had brought l'Escala such prosperity that a visitor would make the observation—truly remarkable, for a Mediterranean fishing village of the time—that "men earn good wages, and there are no poor people."

During the Middle Ages, when salted anchovies were largely a food of the poor, communities all around the Mediterranean produced them, especially in places with ready access to salt. The most famous medieval center of anchovy production was Collioure, where the salting of fish achieved such commercial importance that in 1466 King Louis XI of France exempted the town from the hated *gabelle*, or salt tax. Well into the 20th century, Collioure was home to dozens of salting houses and a fleet of small, wooden fishing boats called *catalans*, whose triangular, lateen sails and bright, primary colors attracted Fauvist painters such as Matisse, Derain and Dufy.

After World War II, however, the catalans were supplanted by larger, steel-hulled vessels known as *tranynas*, which were based in neighboring Port Vendres because they couldn't navigate Collioure's shallow harbor, and the number of salting firms in Collioure declined, from 22 in 1945 to only 2 today. In the town of stone houses and narrow lanes wedged between mountains and the sea, under a sky Matisse called the bluest in all of France, locals now cast for tourists, not fish. But as I learned at the small, modern factory of the Roque company, the care that goes into making a salted anchovy here has not changed in any appreciable way.

From May to October, the anchovy season, fresh fish are rushed to the factory and given an initial salting. In an age-old process, quick-fingered women then gut and behead each anchovy with a single flick of the wrist, and in large barrels carefully alternate layers of fish and sea salt from Aigues-Mortes, in the Rhone delta. Heavy weights keep the fish compressed in the brine that soon develops as salt leaches liquid from the anchovies, penetrates their flesh and, in a simple but impressive feat of biochemical legerdemain, slowly transforms them into a preserved product. Exuding a smell reminiscent of an estuary at low tide, the barrels are kept in cool rooms while the anchovies ripen for three months or more—depending on their size, when they were caught, and the ambient temperature. Only the master salter decides when they are ready.

"Anchovies are like fruit," says Guy Roque, whose 42-employee salting firm was founded by his grandfather in 1870. "If they're not ripe, they don't have as much flavor. And for an anchovy to be ripe, it should have a rich aroma and a rosy color." Fish destined for oil-packed fillets are gently washed in fresh water and manually deboned; a skilled worker can finesse the bones from more than two pounds of anchovies per day. The fillets are laid out to dry overnight and hand-packed in retail-size glass jars or commercial-size plastic tubs, which are then filled with sunflower oil. "Sunflower oil is milder than olive oil," says Roque, "and allows more anchovy flavor to come through." In a traditional preparation seldom sold in the United States, some fish are left whole and packed in salt. Though this means rinsing and filleting them in the kitchen, many Catalan cooks swear they are actually less salty than their oil-packed counterparts.

MASTER CHEF FERRAN Adrià is not the only one who thinks these are tough times for Catalan anchovies. For years, the region's small salting houses have been forced to compete against large factories and their economies of scale. For example, though the anchovy industry in the Cantabria region, on northern Spain's Atlantic coast, dates only to the arrival of Sicilian salters in the 19th century, its production dwarfs that of Catalonia. Morocco now leads the world in canned anchovies, and one Moroccan factory—the biggest anchovy-salting facility on earth—employs 1,400 people. Catalan tra-

Fast hands gut fresh fish in l'Escala. Many of the anchovies salted along the Catalan coast and branded with local names (above) are now trucked in from elsewhere.

ditionalists blame the poor quality of the anchovies most of us eat on methods applied elsewhere to keep costs down—using smaller and less fresh fish, curing them faster, and drying the fillets in centrifuges. And the oldtimers also fret about a fall in anchovy consumption among younger Catalans. "It's the same the world over," laments Francesc Moner, a cigar-chomping anchovy company owner in l'Escala. "Traditional foods are getting left behind by the young for hamburgers and other fast food."

But the declining catch in the Mediterranean remains more troubling than either cheap competition or the popularity of fast food. The sea is far less rich in animal life than the Atlantic, and though European anchovies have never been listed as endangered or threatened, throughout history those from the Mediterranean have been subject to periodic shortages. Unusually hot summer weather, causing sea temperatures to rise beyond the 54 to 68 degrees Fahrenheit range preferred by anchovies, is sometimes the culprit. But overall catch levels have fallen in the past decade regardless of fluctuations in weather, leading industry experts to worry that the recent downturn is more than just a natural, cyclical phenomenon. They point a finger at fishing practices. For the past 20 years, jumbo-size, highly mechanized ships based in France have roamed the sea throughout the year, scooping up fish in huge dragnets. "The nets are much finer than what we use on a tranyna," says Josep Lluis Sureda, a fourth-generation l'Escala fisherman. "All year long they catch everything in their path, even anchovies that are too small for the salters."

In fact, the off-season harvest of juvenile fish by either large ship or tranyna, is the greatest threat to anchovies in the Mediterranean, because it removes fish from the sea before they have a chance to breed. In response, the regional government of Catalonia has closed its waters entirely to anchovy fishing from October to December, part of the traditional off-season, to give the anchovy stock time to replenish itself between harvests.

Still, the catch along the Anchovy Coast the past two years fell so short that fish had to be trucked in for salting from French Atlantic ports and from Cantabria, and even Joan Carles Ninou is using Cantabrian fish in his Barcelona café. Catalan salters put a brave face on the crisis—repeating over and over that what truly makes an anchovy a Catalan anchovy is the traditional manner in which it's prepared. But in the next breath they bemoan the lack of Mediterranean fish, which they find more flavorful than those from colder Atlantic waters.

If the problem of declining catches can be solved, Catalan salters remain hopeful that their anchovy industry will yet survive. There are some signs their optimism may not be misplaced: l'Escala and Collioure have both received legal origin-of-product denominations—akin to the Roquefort name on cheese or the appellation of a wine—so consumers will know when they're buying anchovies certified as having been cured in the two towns. Perhaps, local boosters say, the official labeling will help differentiate their plump, rosy fish from cheaper ones with less flavor prepared elsewhere, and will carve a small niche in the lucrative market for gourmet goods. Younger chefs in both Spain and France are dreaming up new ways to use this ancient product, and big names like Ferran Adrià have stepped up to help with marketing it.

For Robert Desclaux, owner of a 102-year-old Collioure salting house, any effort on behalf of the local anchovy is worth it. At age 77, Desclaux is old enough to remember the graceful catalans gliding by night out of the harbor, past the town's signature bell tower, and the wicker baskets brimming with anchovies being sold on the beach after the boats returned in the morning. "Those times are gone," he says matter-of-factly. "But with work and some luck, I think our anchovies will survive." You don't have to love the little salted fish to hope he's right.

Grilled watermelon topped with anchovies? Standard fare (above) from superstar chef Ferran Adrià (below), who's likely to serve an anchovy gelato for dessert.

"IF WE'RE NOT CAREFUL," WARNS FERRAN ADRIÀ, CITING A SHRINKING CATCH AND THE RISE OF FAST FOOD, "IN FIVE YEARS OUR TRADITION MAY BE LOST."

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MAG-SMITH

SHOWDOWN ON

BUOYED BY HIS REELECTION BUT DISMAYED BY RULINGS OF THE U.S. SUPREME COURT, A PRESIDENT OVERREACHES **BY WILLIAM E. LEUCHTENBURG**

As the first election returns reached his family estate in Hyde Park, New York, on a November night in 1936, Franklin Delano Roosevelt leaned back in his wheelchair, his signature cigarette holder at a cocky angle, blew a smoke ring and cried "Wow!" His huge margin in New Haven signaled that he was being swept into a second term in the White House with the largest popular vote in history at the time and the best showing in the electoral college since James Monroe ran unopposed in 1820.

The outpouring of millions of ballots for the Democratic ticket reflected the enormous admiration for what FDR had achieved in less than four years. He had been inaugurated in March 1933 during perilous times—one-third of the workforce jobless, industry all but paralyzed, farmers desperate, most of the banks shut down—and in his first 100 days he had put through a series of measures that lifted the nation's spirits. In 1933 workers and businessmen marched in spectacular parades to demonstrate their support for the National Recovery Administration (NRA), Roosevelt's agency for industrial mobilization, symbolized by its emblem, the blue eagle. Farmers were grateful for government subsidies dispensed by the newly created Agricultural Adjustment Administration (AAA).

Over the ensuing three years, the cavalcade of alphabet agencies had continued: SEC (the Securities and Exchange Commission); REA (the Rural Electrification Administration) and a good many more. The NYA (National Youth Administration) had permitted college students, such as the future playwright Arthur Miller, to work their way through college. The WPA (Works Progress Administration) had sustained millions of Americans, including artists such as Jackson Pollock and writers such as John Cheever. In a second burst of legislation in 1935, Roosevelt had introduced the welfare state to the nation with the Social Security Act, legislating old-age pensions and unemployment insurance. During the 1936 campaign, the president's motorcade, mobbed by well-wishers wherever he traveled, had to inch along the streets in towns and cities across the nation. His landslide victory that year signified the people's verdict on the New Deal. Franklin D. Roosevelt, wrote Arthur Krock, the chief Washington correspondent for the *New York Times*, had gotten "the most overwhelming testimonial of approval ever received by a national candidate in the history of the nation."

The election-night jubilation was tempered, however, by an inescapable fear—that the U.S. Supreme Court might undo Roosevelt's accomplishments. From the outset of his presidency, FDR

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FINAL EXTRA

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ROOSEVELT SWEEPS THE NATION; HIS ELECTORAL VOTE EXCEEDS 500; LEHMAN WINS; CHARTER ADOPTED

FEW HOUSE SHIFTS

Democrats May Add to Vast Majorities in Both Chambers

THREE SENATORS TRAIL

Barbour, Hastings and Metcalf Appear to Have Lost Seats.

90 HOUSE RACES IN DOUBT

Democrats Elect 254, While Republicans Obtain 84, and Progressives 6.

London Congratulates President, Who Replies

BIG CHARTER VOTE

8-Hour System for Firemen Also Wins Easily

VOTING CHANGE APPROVED

Brunner Is Victor Over Morris by Large Plurality.

ROOSEVELT SWEEP HERE

President's Vote and Margin, Which Reached 1,356,458, Set Highest City Record.

UNION PARTY VOTE FAR BELOW BOASTS

Coughlin Group Appears to Have Exercised Little Influence on the Electorate.

SUPPORT OF LEMKE WEAK

Even in Ohio and South Dakota His Showing in the Early Returns Is Poor.

Smith Plans Comment On the Election Today

LEHMAN VOTE CUT

Bleakley Gets a Surprising Total in the City

SWEEP HELPS GOVERNOR

Roosevelt Strong in Industrial Cities—Gets Big Up-State Poll.

OTHER DEMOCRATS SAFE

Bray, Tremaine, Bennett and Others of State Ticket Regarded Certain of Victory.

DEMOCRATS RETAIN STATE SENATE LEAD

They Are Assured of 30 Seats of the 51, One More Than Their Previous Number.

FAIL TO WIN ASSEMBLY

Republicans Are Beaten for Five Places, but Still Hold a Bare Working Majority.

FRANKLIN D. ROOSEVELT

POLL SETS RECORD

Roosevelt Electoral Vote of 519 Seen as a Minimum

NO SWING TO THE BOLTERS

'Jeffersonian Democrats' Fail to Cause Rift as Expected.

NEIGHBORS HAIL PRESIDENT

Landon Concedes Defeat and Sends His Congratulations to Victorious Rival.

DEMOCRATS SWEEP ALL PENNSYLVANIA

President Wins by More Than

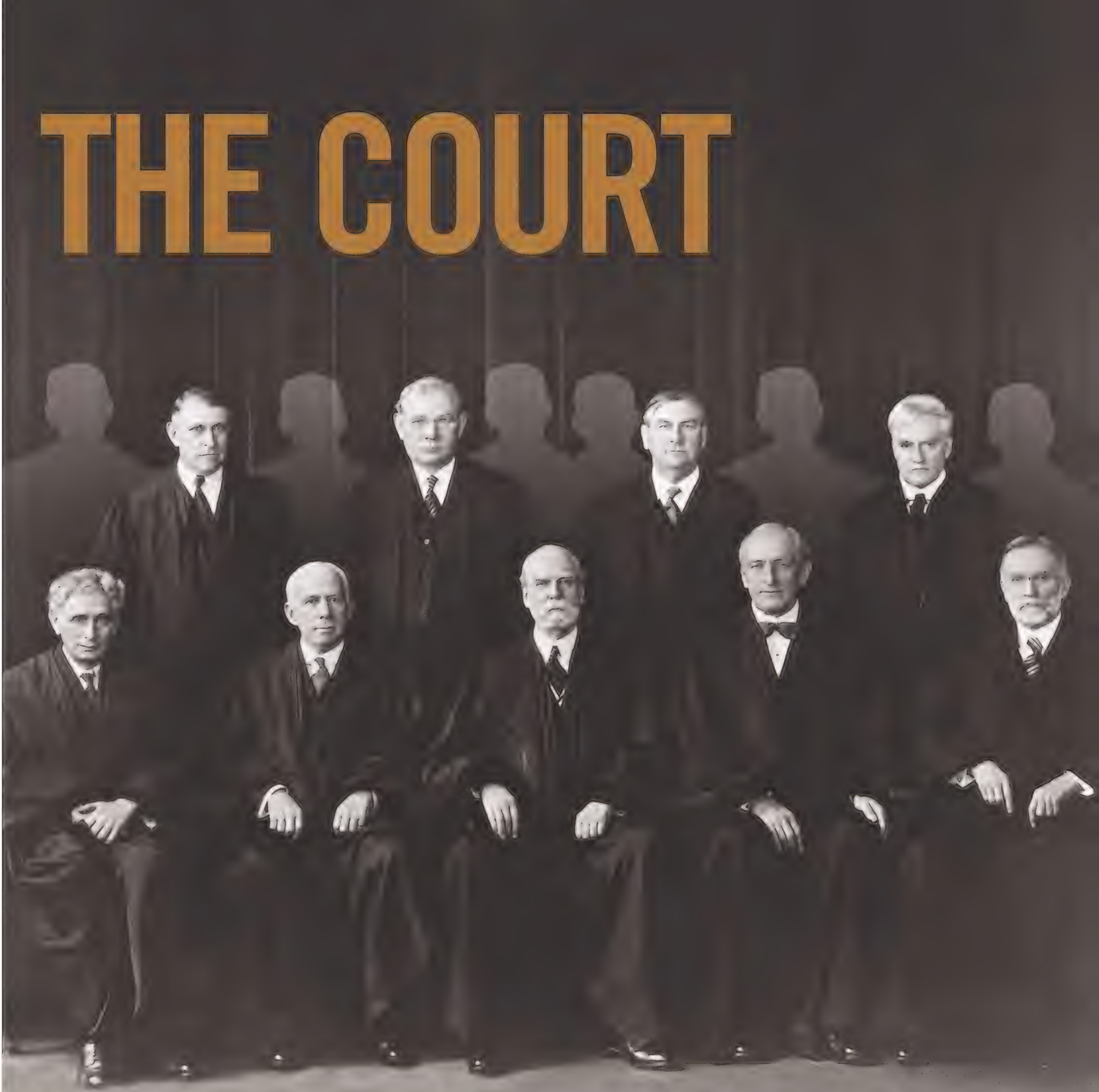
JERSEY'S 16 VOTES SAFE FOR NEW DEAL

Upsets in Republican Areas

GRANGER COLLECTION, NEW YORK; P. 107 HULTON ARCHIVE / GETTY IMAGES, PHOTO ILLUSTRATION BY BRIAN NOYES

Roosevelt felt his 1936 reelection (above) signified overwhelming support for the New Deal. As the Supreme Court struck down his reforms, he devised a plan to save them (headlined, opposite): outvote the five conservatives on the court by adding six new justices (at right, in photo illustration). FDR heeded his attorney general's warning: "Mr. President, they mean to destroy us."

THE COURT



ROOSEVELT ASKS POWER TO REFORM COURTS, INCREASING THE SUPREME BENCH TO 15 JUSTICES; CONGRESS STARTLED, BUT EXPECTED TO APPROVE

had known that four of the justices—Pierce Butler, James McReynolds, George Sutherland and Willis Van Devanter—would vote to invalidate almost all of the New Deal. They were referred to in the press as "the Four Horsemen," after the allegorical figures of the Apocalypse associated with death and destruction. In the spring of 1935, a fifth justice, Hoover-appointee Owen Roberts—at 60 the youngest man on the Supreme Court—began casting his swing vote with them to create a conservative majority.

During the next year, these five judges, occasionally in concert with others, especially Chief Justice Charles Evans Hughes, struck down more significant acts of Congress—including the two foundation stones, the NRA and the AAA, of Roosevelt's program—than at any other time in the nation's history, before or since. In May 1935, the court destroyed FDR's plan for industrial recovery when, in a unanimous decision involving a kosher poultry business in Brooklyn, it shot down the blue eagle. Little more than seven months later, in a 6 to 3 ruling, it annihilated his farm program by determining that the Agricultural Adjustment Act was unconstitutional. Most of the federal government's authority over the economy derived from a clause in the Constitution empowering Congress to regulate interstate commerce, but the court construed the clause so narrowly that in another case that next spring, it ruled that not even so vast an industry as coal mining fell within the commerce power.

These decisions drew biting criticism, from inside and outside the court. Justice Harlan Fiske Stone, a Republican who had been Calvin Coolidge's attorney general, denounced Roberts' opinion striking down the farm law as a "tortured construction of the Constitution." Many farmers were incensed. On the night following Roberts' opinion, a passerby in Ames, Iowa, discovered life-size effigies of the six majority opinion justices hanged by the side of a road.

Fury at the court intensified when, in its final action of the term, it handed down a decision in the Tipaldo case. Until that point, defenders of the court had contended that the justices were not opposed to social legislation; the jurists merely wanted such laws to be enacted by the states, not the federal government. But early in June 1936, the court, by 5 to 4, struck down a New York state law providing a minimum wage for women and child workers. Laundry owner Joe Tipaldo, said the court, could continue to exploit female workers in his Brooklyn sweatshop; the state was powerless to stop him. "If this decision does not outrage the moral sense of the country," said Secretary of the Interior Harold Ickes, "then nothing will." And, indeed, people of all political persuasions were incensed. On its editorial page, the *Knickerbocker Press*, an upstate New York Republican newspaper, asserted, "The law that would jail any laundryman for having an underfed horse should jail him for having an underfed girl employee."

The Tipaldo ruling persuaded Roosevelt that he had to act, and act quickly, to curb the court. As he told the press, the court had created a "'no-man's-land' where no Government—State or Federal—can function." He had been waiting patiently for popular dissatisfaction with the court to mount; now anger at the Tipaldo decision surged. That ruling, the historian Alpheus T. Mason later wrote, "convinced even the most reverent that five stubborn old men had planted themselves squarely in the path of progress." The president recognized, however, that he must tread carefully, for despite widespread disgruntlement, most Americans believed the Supreme Court sacrosanct. When, in 1935, FDR had criticized it for adopting a "horse-and-buggy definition of interstate commerce," editorial writers had lashed out at him. Thereafter, the president had said little, even as he qui-

Cartoonists summed up the confrontation: save New Deal agencies (left) by launching an assault on the judicial branch (right).

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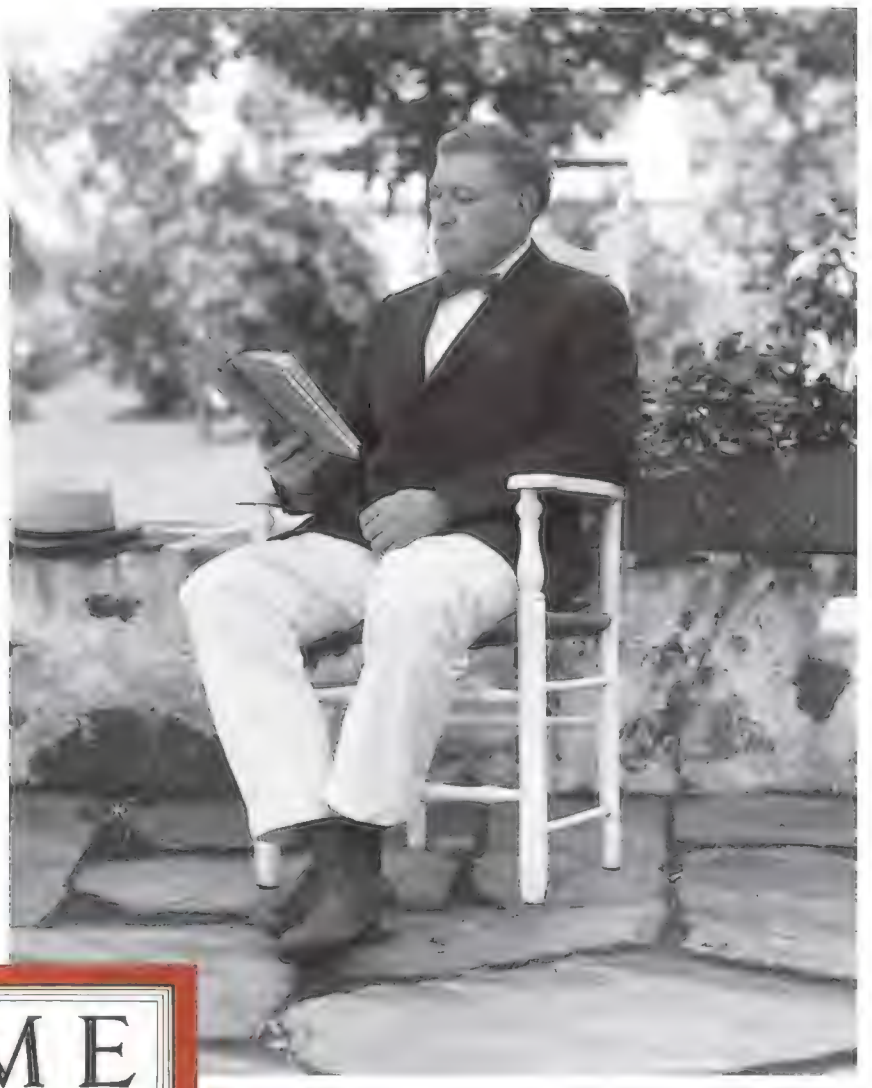
etly heeded the counsel of his attorney general, Homer Cummings, who told him, "Mr. President, they mean to destroy us. . . . We will have to find a way to get rid of the present membership of the Supreme Court." With Roosevelt's encouragement, Cummings sought to come up with a workable plan to ensure a more favorable response to the New Deal from the court. These explorations proceeded stealthily; the president never mentioned the court during his campaign for reelection.

Roosevelt, however, had concluded that he could not avoid a confrontation with the court; it had already torpedoed the two principal recovery projects of his first term. It would soon rule on the Social Security Act and the National Labor Relations Act (the Wagner Act), regarded by the administration as a factory workers' Magna Carta. Legal analysts anticipated that the court would strike down both laws. In Tipaldo, it had gone so far as to say that the state was "without power by any form of legislation" to modify labor contracts between employers and women workers. Roosevelt surmised that he would be unable to take advantage of his landslide to sponsor new measures, such as a wages-and-hours law, because that legislation, too, would be invalidated.

In the days following the 1936 election, FDR and Cummings put the final touches on an audacious plan to reconfigure the court. Dissents by Stone and other justices, notably Louis Brandeis and Benjamin Cardozo, persuaded Roosevelt that he need not undertake the arduous route of a constitutional amendment, for it was not the Constitution that required changing but the composition of the bench. Naming a few more judges like Stone, the president believed, would do the trick. FDR recognized, though, that a direct assault on the court must be avoided; he could not simply assert that he wanted judges who would do his bidding. The most promising approach, it seemed, would be to capitalize on the public's concern about the ages of the justices. At the time of his reelection, it was the most elderly court in the nation's history, averaging 71 years. Six of the justices were 70 or older; a scurrilous book on the court, *The Nine Old Men,* by Drew Pearson and Robert Allen, was rapidly moving up the best-seller lists.

But Roosevelt kept Congressional leaders, his cabinet (save for Cummings) and the American people in the dark, deceiving even the shrewdest experts. On January 24, 1937, the editor of the authoritative journal *United States Law Week* declared that it was "plain that he does not at the present time have in mind any legislation directed at the Court." The Supreme Court itself had no inkling of what was afoot. When the president entertained the judiciary at a White House dinner on February 2, he told adviser Donald Richberg that "his choice should be whether to take only one cocktail before dinner and have it a very amiable affair, or to have a mimeographed copy of the program laid beside the plate of each justice and then take three cocktails to fortify himself against their reactions." The banquet was an amiable affair. But as the evening drew to a close, Idaho's senator William Borah, sensing something as he saw the president chatting with two of the justices, remarked: "That reminds me of the Roman Emperor who looked around his dinner table and began to laugh when he thought how many of those heads would be rolling on the morrow."

Three days later, on February 5, 1937, Roosevelt shocked Congress, his closest advisers and the country by unleashing a thunderbolt. He asked Congress to empower him to appoint an additional justice for any member of the court over age 70 who did not retire. He sought to name as many as six additional Supreme Court justices, as well as up to 44 judges to the lower federal courts. He justified his request not by contend-



Justice Owen Roberts (above, at his Pennsylvania farm) never explained why he began voting in support of the New Deal. Perhaps, historians conjecture, Chief Justice Charles Evans Hughes (on the cover of *Time*, 1937) convinced him it was prudent to do so.

Historian WILLIAM E. LEUCHTENBURG *has written six books on FDR and his era. His latest book,* The White House Looks South: Franklin D. Roosevelt, Harry S. Truman, Lyndon B. Johnson, *will be published this September.*

BETTMANN / CORBIS; HARRIS AND EWING / TIME INC. / GETTY IMAGES

Roosevelt's controversial plan led to Senate hearings (Attorney General Homer Cummings, far right, testified March 10, 1937). Cummings argued for appointing "men of fresh outlook who will refrain from infringing upon the powers of the Congress."

AP / WIDE WORLD PHOTO / DC PUBLIC LIBRARY WASHINGTONIANA COLLECTION

ing that the court's majority was reactionary, but by maintaining that a shortage of judges had resulted in delays to litigants because federal court dockets had become overburdened.

"A part of the problem of obtaining a sufficient number of judges to dispose of cases is the capacity of the judges themselves," the president observed. "This brings forward the question of aged or infirm judges—a subject of delicacy and yet one which requires frank discussion." He acknowledged that "in exceptional cases," some judges "retain to an advanced age full mental and physical vigor," but quickly added, "Those not so fortunate are often unable to perceive their own infirmities." Life tenure, he asserted, "was not intended to create a static judiciary. A constant and systematic addition of younger blood will vitalize the courts."

Roosevelt's message touched off the greatest struggle in our history among the three branches of government. It also triggered the most intense debate about constitutional issues since the earliest weeks of the Republic. For 168 days, the country was mesmerized by the controversy, which dominated newspaper headlines, radio broadcasts and newsreels, and spurred countless rallies in towns from New England to the Pacific Coast. Members of Congress were so deluged by mail that they could not read most of it, let alone respond. Senator Hiram Johnson of California noted, "I received some hundreds of letters a day, all on the Court—sometimes some thousands," and Senator Royal Copeland of New York, inundated by 30,000 letters and telegrams, begged his constituents to desist.

Both sides believed the future of the country was at stake. If Roosevelt won, opponents warned, he would destroy the independence of the judiciary and create an evil precedent for successors who wished to "pack" the court. If Roosevelt lost, his supporters countered, a few judges appointed for life would be able to ignore the popular will, destroy programs vital to the welfare of the people, and deny to the president and Congress the powers exercised by every other government in the world. Although the country divided evenly on the issue—about as many were for Roosevelt's plan as against it—the opposition drew far more attention, especially on editorial pages.

Despite widely publicized expressions of hostility, political pundits expected the legislation to be enacted. So long were FDR's coattails in the 1936 contest that when the Senate convened in the new year, many Democrats had to sit on the Republican side of the aisle, for every Democratic seat was occupied; the Republicans were left with only 16 members. Roosevelt had high expectations, too, for the House of Representatives, where Democrats held a 4 to 1 advantage. *Time* magazine reported initially that "the bill would be passed without serious difficulty."

That prospect drove opponents of the plan to a fury of activity: protest meetings, bar association resolutions and thousands upon thousands of letters to editors. At a time when totalitarianism was on the march, Roosevelt's foes accused him of mimicking Hitler, Mussolini and Stalin by seek-

ing to concentrate power in the hands of one man. FDR's supporters responded that at a time when democracy was under fire, it was vital to show the world that representative government was not hobbled by judges. That argument, however, was more subtle and harder to explain to the public.

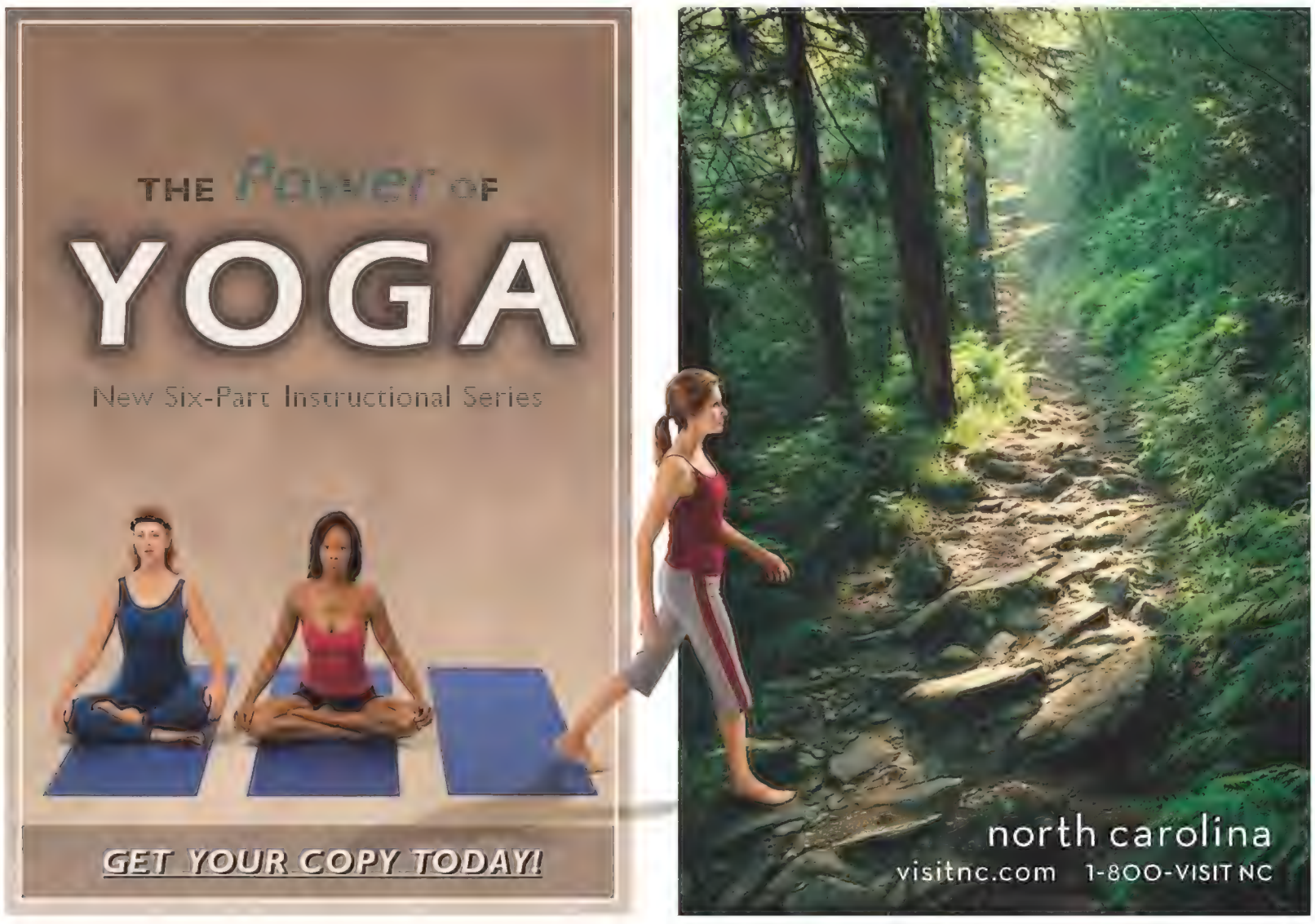
Opponents also objected to FDR's focus on the justices' advanced ages. They saw it as a ruse to conceal his real, and in their eyes, nefarious objective, and as a display of gross disrespect for the elderly. One critic wrote in a letter to the *Washington Post*: "Between the ages of 70 and 83, Commodore Vanderbilt added one hundred million dollars to his fortune. . . . At 74 Immanuel Kant wrote his 'Antropology,' the 'Metaphysics of Ethics,' and 'Strife of the Faculties.' . . . Goethe at 80 completed 'Faust.' . . . At 98 Titian painted his historic picture of the 'Battle of Lepanto.' . . . Can you calculate the loss to the world if such as these had been compelled to retire at 70?"

Roosevelt's adversaries took full advantage of the opportunity to advance their case in hearings before the Senate Judiciary Committee held in March and April 1937. "This bill obviously is not playing the game," said Professor Erwin Griswold of Harvard Law School. "There are at least two ways of getting rid of judges. One is to take them out and shoot them, as they are reported to do in at least one other country. The other way is more genteel, but no less effective. They are kept on the public payroll but their votes are canceled."

The most dramatic testimony came from an unexpected participant: the Chief Justice of the United States. In a letter read by the Montana Democratic senator Burton K. Wheeler, Charles Evans Hughes blew gaping holes in the president's claim that the court was behind in its schedule and that additional justices would improve its performance. Instead, he insisted, "There would be more judges to hear, more judges to confer, more judges to discuss, more judges to be convinced and to decide."

Yet even after the chief justice's powerful statement, most observers still expected Roosevelt's proposal to be adopted. *Time* reported in late March that "the stanchest foes of the President's Plan were privately conceding that, if he chose to whip it through, the necessary votes were already in his pocket." Almost no legislator really liked FDR's scheme, but most Democratic senators thought they could not justify to their constituents defying the immensely popular president in order to keep intact a court that had given the country every reason to suppose it would soon strike down cherished new laws, including the Social Security Act.

The court, however, would spring some surprises of its own. On March 29, by 5 to 4, in West Coast Hotel Co. v. Parrish, it validated a minimum wage law from the state of Washington, a statute essentially no different from the



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New York state act it had struck down only months before. As a result, a hotel in Wenatchee, Washington, would be required to pay back wages to Elsie Parrish, a chambermaid. Two weeks later, in several 5 to 4 rulings, the court sustained the National Labor Relations Act. A tribunal that in 1936 had held that coal mining, although conducted in many states, did not constitute interstate commerce, now gave so broad a reading to the Constitution that it accepted intervention by the federal government in the labor practices of a single Virginia clothing factory. On May 24, the court that in 1935 had declared that Congress, in enacting a pension law, had exceeded its powers, found the Social Security statute constitutional.

This set of decisions came about because one justice, Owen Roberts, switched his vote. Ever since, historians have argued about why he did so. We know that he changed his mind on the validity of minimum wage laws for women before Roosevelt delivered his court-packing message, so FDR's proposal could not have been the proximate cause. Since there is no archival evidence to account for his abrupt change on the minimum wage cases, scholars have been reduced to speculation. Perhaps, during a visit to Roberts' country retreat in Pennsylvania, Chief Justice Hughes had warned his younger colleague that the court was placing itself in jeopardy. Perhaps Roberts was impressed by the dimensions of FDR's landslide, which indicated that the president, not the court's majority, spoke for the nation. Perhaps he was affected by the biting criticism from within the legal community. It is even harder to account for why Roberts, in his subsequent votes in the Wagner Act and Social Security cases, supported such a vast extension of federal power—but the pressure exerted by the court-packing bill may very likely have been influential.

Roberts' switch had two consequences for Roosevelt, only one of them good. The president could rejoice that his program might now be safe, as

indeed it was. Never again would the court strike down a New Deal law. But Roberts' switch—and the announcement by Willis Van Devanter, one of the Four Horsemen, that he planned to retire—seriously undermined support for FDR's court-packing bill. Why, senators asked, continue the fight after the court was rendering the kinds of decisions the president had been hoping for? Or, as one wag put it, "Why shoot the bridegroom after a shotgun wedding?" With each new ruling upholding the government, support for the legislation eroded, and by the end of May Roosevelt no longer had the votes needed to enact the measure. Washingtonians regaled one another with a reworking of an old proverb that speedily made the rounds of movers and shakers: "A switch in time saved nine."

In truth, the jest was a mite too clever, for the struggle had not yet ended, but after Robert's switch Roosevelt was never again as powerful as he had been that election night in November. On July 22, the Senate, weary of the strife, buried FDR's bill. From the Senate floor, California's Hiram Johnson, arms upstretched in a victory salute, looked up at the galleries and cried, "Glory be to God!"

The nasty fight over court packing turned out better than might have been expected. The defeat of the bill meant that the institutional integrity of the United States Supreme Court had been preserved—its size had not been manipulated for political or ideological ends. On the other hand, Roosevelt claimed that though he had lost the battle, he had won the war. And in an important sense he had: he had staved off the expected invalidation of the Social Security Act and other laws. More significantly, the switch in the court that spring resulted in what historians call "the constitutional revolution of 1937"—the legitimation of a greatly expanded exercise of powers by both the national and state governments that has persisted for decades.

The 168-day contest also has bequeathed some salutary lessons. It instructs presidents to think twice before tampering with the Supreme Court. FDR's scheme, said the Senate Judiciary Committee, was "a measure which should be so emphatically rejected that its parallel will never again be presented to the free representatives of the free people of America." And it never has been. At the same time, it teaches the justices that if they unreasonably impede the functioning of the democratic branches, they may precipitate a crisis with unpredictable consequences. In his dissent in the AAA case in 1936, Justice Stone reminded his brethren, "Courts are not the only agency of government that must be assumed to have capacity to govern." These are lessons—for the president and for the court—as salient today as they were in 1937.

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HOW A DARK TALE OF LOVE, MADNESS AND MURDER IN 18TH-CENTURY LONDON BECAME A STORY FOR THE AGES **BY JOHN BREWER**

Newspapers praised the Earl of Sandwich's "tenderness," mourned "lovely" Martha Ray, and pitied "unfortunate" James Hackman.

NATIONAL PORTRAIT GALLERY, LONDON; CHRISTIE'S IMAGES LIMITED; MARY EVANS PICTURE LIBRARY

UNSEASONABLE HEAT and humidity on the evening of April 7, 1779, did not stop Londoners' usual pursuit of business and pleasure. Over in Whitehall, the first lord of the admiralty, the Earl of Sandwich, discussed with his harried colleagues the prosecution of the American war. A key strategist in bringing the 13 colonies to heel, Sandwich was a tall, rather clumsy man in his 60s known as a libertine, a passionate fan of the sport of cricket and a great patron of music, especially the work of George Frideric Handel. He was also a hardworking and ruthless politician. The snack that bears Sandwich's name, which was first made by slipping a slice of salted beef between two pieces of bread, was invented not, as legend would have it, to allow the earl longer hours at the gaming table but more time at the office. On this particular evening Sandwich's late-night labors—he had originally planned to go to the theater—were prompted by a pressing threat to his political career. The war in America was going badly, George III's administration was in disarray, and it looked as if Sandwich might be sacrificed to appease government critics.

Across town at the Covent Garden Theatre, where Sandwich had hoped to spend a more amusing evening, ladies and gentlemen, merchants and lawyers were pouring through the lobby for a benefit performance of the popular comic opera *Love in a Village*. These two events, seemingly unconnected and so different in character, were to be brought together by a terrible crime of passion perpetrated that night.

Among the evening's theatergoers was Martha Ray, Sandwich's 35-year-old mistress. Ray, the daughter of a corset maker, had been a milliner's apprentice before falling in with the earl. At this point, she had been Sandwich's mistress for more than 16 years, the mother of five of his six children, and his public consort. A contemporary described her as "not what we would call elegant, but which would pass under the denomination of pretty; her height was about five feet five inches; she was fresh-coloured, and had a perpetual smile on her countenance, which

rendered her agreeable to every beholder." One admirer described her as "a second Cleopatra—a Woman of thousands, and capable of producing those effects on the Heart which the Poets talk so much of and which we are apt to think Chimerical."

While the earl labored over naval manifests and how to justify the war's growing expense (he survived the immediate crisis and remained first lord of the admiralty until 1782), Ray and her companion, the Italian singer Caterina Galli, took their seats close to the royal box, where they not only enjoyed one of the best views of the stage but were easily seen by the rest of the audience. The two women would be joined during the course of the evening by a number of male admirers with whom they would chat and flirt while the performance was in progress.

Across the theater in the pit, a tall, handsome young man in his 20s, dressed entirely in black, watched the earl's mistress. The Rev. James Hackman—according to the *St. James's Chronicle*, a "Person of Abilities, . . . descended from a very reputable family, distinguished for Taste and Delicacy of Sentiment"—was deeply infatuated with Ray and heartbroken at her rejection of his offers of love and marriage. Turning his back on this fashionable scene, he hastened to his lodgings close by the theater to retrieve two loaded pistols and to compose a note to his brother-in-law:

My Dear Frederick
When this reaches you I shall be no more, but do not let my unhappy fate distress you too much. I have strove against it as long as possible, but it now overpowers me. You know where my affections were placed; my having by some means or other lost hers, (an idea which I could not support) has driven me to madness. . . . May heaven protect my beloved woman, and forgive this act which alone could relieve me from a world of misery I have long endured. Oh! if it should be in your power to do her any act of friendship, remember your faithful friend.

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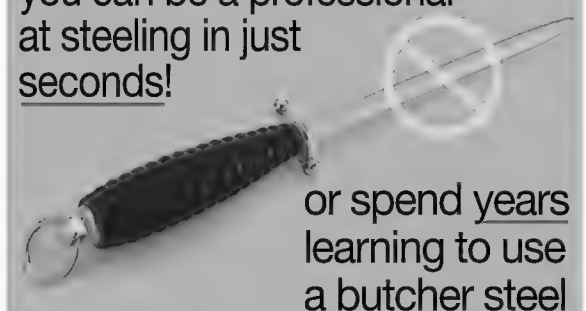

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In his misery, Hackman hastened to his lodgings close by the theater to retrieve two pistols and compose a note begging forgiveness.

Stuffing the note in one pocket together with one of the pistols, he put another letter—his rejected proposal of marriage—in his other pocket with the second weapon.

His pockets full of sentiment and violence, Hackman then returned to Covent Garden. He seems to have entered the theater several times during the evening (a full night's entertainment lasted nearly five hours), retreating to the nearby Bedford Coffeehouse to strengthen his resolve with glasses of brandy and water. His friends claimed that he then attempted to shoot himself on two occasions, first in the lobby, where he was prevented by the crowd from getting close enough to Ray to be sure that she would witness his death, and then on the steps of the theater, where he was pushed away from her by a man carrying the sedan chair of one of the theater's wealthy patrons.

At about a quarter past eleven, Ray and Caterina Galli came out of the theater, where the large crowd jostled them and prevented them from reaching their waiting carriage. John Macnamara, a handsome young Irish attorney, saw the two women, who, as a friend of Macnamara's put it, "seemed somewhat distressed by the crowd, whereupon he offered his service to conduct them to their carriage, which was accepted, and Miss Ray took hold of his arm." Threading their way through the swirl of parting spectators and down the steps of the theater, Galli entered the carriage first. Ray followed, putting her foot on the carriage step as Macnamara held her hand. At that moment, a figure in black dashed forward and

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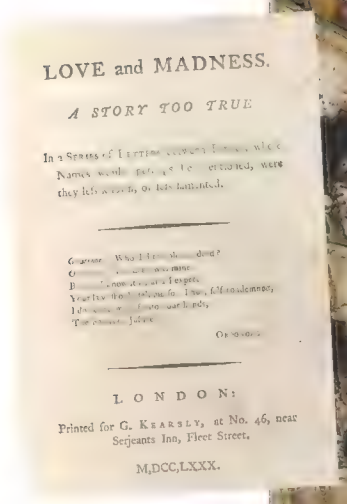
pulled Ray by the sleeve; she turned to find herself face to face with Hackman. Before she could utter a word, he pulled the two pistols from his pockets, shot Ray with the one in his right hand, and shot himself with the other.

As the crowd shrank back, Macnamara, unsure of what had happened, lifted Ray from the ground and found himself drenched in blood. Years afterward he would recall (somewhat hyperbolically) "the sudden assault of the assassin, the instantaneous death of the victim, and the spattering of the poor girl's brains over his own face." According to author and gossip Horace Walpole, Hackman "came round behind [Ray], pulled her by the gown, and on her turning round, clapped the pistol to her forehead and shot her through the head. With another pistol he then attempted to shoot himself, but the ball grazing his brow, he tried to dash out his own brains with the pistol, and is more wounded by those blows than by the ball." Hackman writhed on the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The Covent Garden Theatre (above), where Ray was shot, burned down in 1808, but Herbert Croft's *Love and Madness* (inset) was popular for much of the 19th century.

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Were Ray and Hackman actual lovers, or was Hackman an 18th-century John Hinckley stalking the Georgian equivalent of Jodie Foster?

ground, "beating himself about the head . . . crying, 'o! kill me! . . . for God's sake kill me!'"

With the help of a bystander, Macnamara, shocked but with great composure, carried Ray's lifeless body across the square and into the nearby Shakespeare Tavern, where she was laid on a table in a private room. Meanwhile, a passing constable had arrested Hackman and confiscated his pistols and the two letters in his pockets. Sir John Fielding, a magistrate (and the blind half brother of novelist Henry Fielding), was summoned, and he arrived at the Shakespeare at three o'clock in the morning. He committed Hackman to prison, to be held for questioning the next day.

A little more than a week later, Hackman went on trial for murder at a packed session of the Old Bailey courthouse. His lawyers entered a defense of temporary insanity. They argued that Hackman had yielded to a sudden and "irresistible impulse" prompted by a fit of jealousy at seeing Ray on the arm of another man. "I protest, with that regard for truth which becomes my situation," Hackman passionately testified, "that the will to destroy her who was ever dearer to me than life, was never mine, until a momentary phrenzy overcame me, and induced me to commit the deed I deplore." But the court, most likely persuaded by the existence of Hackman's second pistol, did not hesitate to find him guilty. Eighteenth-century justice was swift. Hackman

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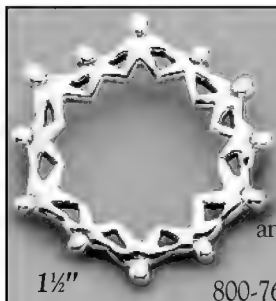

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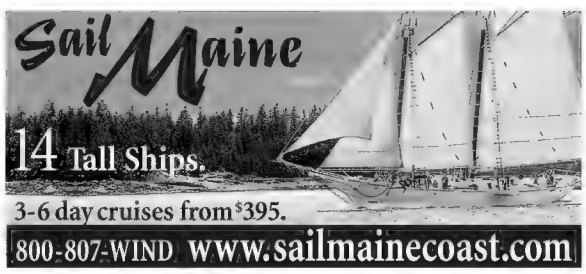

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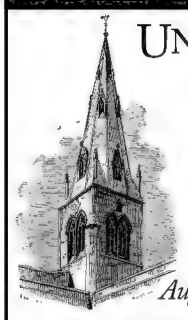

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was executed a few days after the trial before a vast crowd of onlookers. His last words, it was reported, referred to his "dear Miss Ray."

Hackman's crime prompted an orgy of speculation. There was never any doubt that Hackman had killed Ray—a large crowd of rich and fashionable theatergoers had witnessed the bloody deed—but why had he done it? Were Ray and Hackman actual lovers, or was Hackman an 18th-century John Hinckley stalking the Georgian equivalent of Jodie Foster, pressing his unwanted attentions on a public figure?

The newspapers quickly established that the couple had first met in 1775 at Hinchingbrooke, Lord Sandwich's country seat, but there was almost no public knowledge of what, if anything, had happened between that meeting and the murder four years later.

THE TALE OF RAY, Hackman and Sandwich intrigued me both as a historian of the 18th century and a lover of detection. Surely it would be possible to crack the secret, to learn what lay at the heart of this love triangle and why Hackman had resorted to such terrible violence. As I probed, I came to conclude that the story's very inconclusiveness, its openness to interpretation, contributed to its fascination and helped explain why the case had been reopened, reexamined and reworked in many different forms—in prose and verse, history, biography, medical science and fiction. What began for me as the history of an event turned into a history of storytelling.

The first newspaper accounts appeared within hours of the murder. The papers' coverage was based on information provided by the murderer and by Lord Sandwich, both of whom suppressed as much as they revealed. Eighteenth-century newspapers (there were 13 in London and more than 40 in the provinces) relied more on spies, paid informants and interested parties than on reporters. Sandwich, for example, enjoyed a special relationship with the *Morning Post*.

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(Its editor had a pension from the king's secret funds.)

So first accounts offered a highly sympathetic telling of the case in which all three protagonists—Sandwich, Ray and Hackman—were portrayed as victims. Sandwich was a reformed rake deprived of the woman he loved, Ray was murdered at the hands of a young man who would not take no for an answer, and Hackman was an upstanding young man driven to a mad act by the power of love. The plot and its characters came right out of the sort of sentimental novel that was being published in huge numbers in the 1770s and in which everyone was a victim.

But after Hackman was executed, his friends went on the offense. They portrayed the perpetrator as a gullible young man lured out of his depth and into a corrupt, high-living world of "lucre, rank and fortune," as Hackman's lawyer, Mannaseh Dawes, put it in his *Case and Memoirs of the late Rev. Mr. James Hackman*. It was a world where Sandwich and then Ray—"a capricious and an ungrateful woman"—misled Hackman, leading him on to his terrible crime. The story of Hackman's crime became an indictment of the political and social world inhabited by the earl and his mistress and, by extension, of the prosecution of the fratricidal conflict with America. As one journal put it, "Illicit love now reigns triumphant, pervading all degrees, from the peer . . . to the peasant."

Within a year of Ray's death, a London bookseller, well known for his support of the Americans' cause and his opposition to the government that Sandwich served so ardently, published a book entitled *Love and Madness: A Story Too True*, which claimed to be the correspondence of the murderer and his victim. In it, Hackman is cast as a romantic hero struggling with the demons of love. *Love and Madness* quickly became a best-seller and remained in print into the 19th century. But the book was a fake. In fact, the letters were the work of a journalist, Herbert Croft, who deftly recast a story that actually had many actors and intertwined plots into one with a sole tragic

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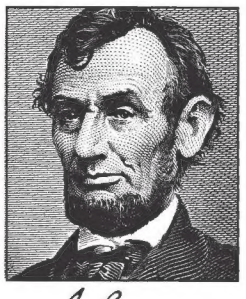

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Although the book was a fake, it helped enshrine Hackman in medical literature as an exemplary case of erotomania, or love's madness.

protagonist: Hackman. Most readers didn't seem to care that the letters weren't real. The book was hugely influential and helped enshrine Hackman in medical literature as an exemplary case of erotomania, or love's madness.

IN THE VICTORIAN era the story changed yet again. A succession of memoirs and letters of 18th-century life (the most famous were those of Horace Walpole) included accounts of Ray, Hackman and Sandwich. Reviewers and critics pounced on the threesome as typical of the depravity of the Georgian age, what the novelist William Makepeace Thackeray called its "awful debauchery and extravagance." In these, Hackman had become an assassin, Ray a wretched whore, Sandwich a public disgrace. From the vantage point of the mid-19th century, the story exemplified 18th-century wickedness, as well as evidence of the moral progress that had been made in the intervening years. As one reviewer smugly wrote in the *Edinburgh Review* about the memoirs of George Selwyn, the notorious 18th-century gossip, "We are happy to say that the comparison, suggested by these volumes, between the manners and morals of the last century and our own, is highly satisfactory."

By the end of the 19th century the three lovers had been resurrected by Gilbert Burgess' *The Love Letters of Mr. H and Miss R 1775-1779*. This bowdlerized and edited version of Croft's *Love and Madness* was presented as a collection of historical documents. Critics applauded it as "natural and credible,"

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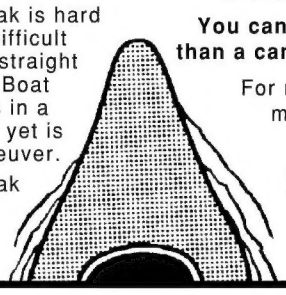
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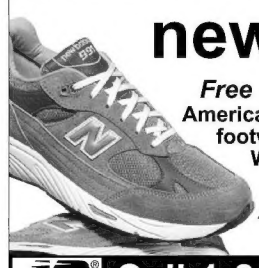
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Finally, in the 20th century, female authors were able to draw on Burgess' "documents" to write the history of the crime from Martha Ray's point of view. They explored the moral dilemma of a woman tied by her children and her poverty to a rich keeper but who, it was supposed, genuinely loved a far more attractive, if impecunious, young man.

Every age, it would seem, rewrote the story for its own purposes. The stern Victorian condemnation of the love triangle is based on the same evidence as the sympathetic accounts written in the 18th century. The differences in motive and moral stance stem only from the larger narrative framework.

So where does the truth lie? I have to confess I do not know. Rereading the many versions, I find none totally convincing; at the same time, all lack the evidence a historian needs to offer an alternative narrative. I suspect, however, that the love triangle was more complicated (and messy) than the historical record implies. The "truth" will probably never be revealed, not least because early efforts to suppress it were so successful.

But the manner in which the story of the three lovers has been told gives us a different sort of insight. It shows how changing values and attitudes continue to shape our perceptions of the past. Who knows, the 21st century may yet yield its own, radically different interpretation. For now, however, the most widely cited version of the "truth" remains Herbert Croft's entirely fictional *Love and Madness.* Its enduring appeal lies in its powerful evocation of the snares and pitfalls of obsessive love that claimed three victims outside the Covent Garden Theatre on a sultry spring night in 1779.

JOHN BREWER is a professor of history at Caltech and the author of A Sentimental Murder: Love and Madness in the Eighteenth Century *(2004).*

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FRIED EGGS TO SAVOR

WHY A NEARLY 400-YEAR-OLD PAINTING REMAINS NOURISHING AFTER ALL THESE YEARS **BY JOHN MORTIMER**

I HAVE A GALLERY OF PICTURES in my head so that if I went blind, I could still enjoy them. I would direct you to the National Gallery of Scotland, one of the least exhausting, most rewarding collections in the world that, in a few comfortably intimate rooms, contains more masterpieces to the square foot than you have the right to expect. Among the saints and great ladies, the naked beauties and the suffering martyrs, taking her rightful and honorable place is an old woman cooking eggs, by Velázquez.

Velázquez went to Madrid in his 20s and very soon became a court painter, truthfully observing pale-lipped kings, overdressed infantas and the sad faces of the palace dwarfs. Before that he served five years' apprenticeship to a Sevillian painter whose daughter he married and, taking time off from his religious paintings, looked hard and clearly into the kitchen.

The everyday scene in the Edinburgh gallery is lit in the sort of way the painter learned from Caravaggio, so that the objects in the kitchen achieve an extraordinary significance. The old woman has an aquiline, Sevillian nose, sharp eyes, a firm mouth and gray hair. The white cloth on her head and shoulders falls in soft folds on the coarse material of her dress. She has the suntanned, loose-skinned hands of her age, but one of them holds an egg carefully, and the other delicately points a small wooden spoon, ready to drip a little oil in which we can see eggs setting, their yolks and whites clear in the pan. An unsmiling peasant boy is carefully dripping in more oil, and the old woman watches him anxiously. The miracle of the 1618 painting is the exact and loving re-creation of oil, eggs and earthenware, the shine on the brass pots, the shadow of a knife on a china dish, the feeling of flesh and cloth. Forget all concerns about blessings or terrifying events occurring beyond the grave, this picture celebrates the significant moment when the eggs start cooking and another spoonful of oil has to be dribbled in.

The old woman, or someone very like her, turns up again in another of Velázquez's kitchen scenes, this time in London's National Gallery. Her head is again covered with a white cloth and she is instructing a sulky and unwilling Martha on how to pound garlic and cook some fresh fish and more eggs. In a mirror we can see that Jesus has arrived at the door and is about to engage the no-doubt-eager Mary in a conversation about life, death and the miracle of salvation. Far more interesting to the old woman is seeing that the fish is cooked properly, dinner is on the table in time and the garlic is well pounded.

Velázquez went on to paint grander scenes. Venus, the Goddess of Love, lies naked, admiring herself in a mirror held up by Cupid, presenting to us her splendid bottom. He painted kings on prancing horses and military triumphs such as the surrender of Breda and royal persons hunting wild boar. He became famous in Italy for his portrait of Pope Innocent X, a merciless military commander. His final act was to decorate the Spanish Pavilion on the Isle of Pheasants for the marriage of the Infanta Maria Theresa.

Through all these great events, wars and festivals, the lives of kings and popes, the old woman remained busy in the kitchen, dealing with the important things in life, such as the exact amount of olive oil needed to fry eggs.

DIEGO RODRIGUEZ DE SILVA Y VELASQUEZ / NATIONAL GALLERY OF SCOTLAND, EDINBURGH / BRIDGEMAN ART LIBRARY

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